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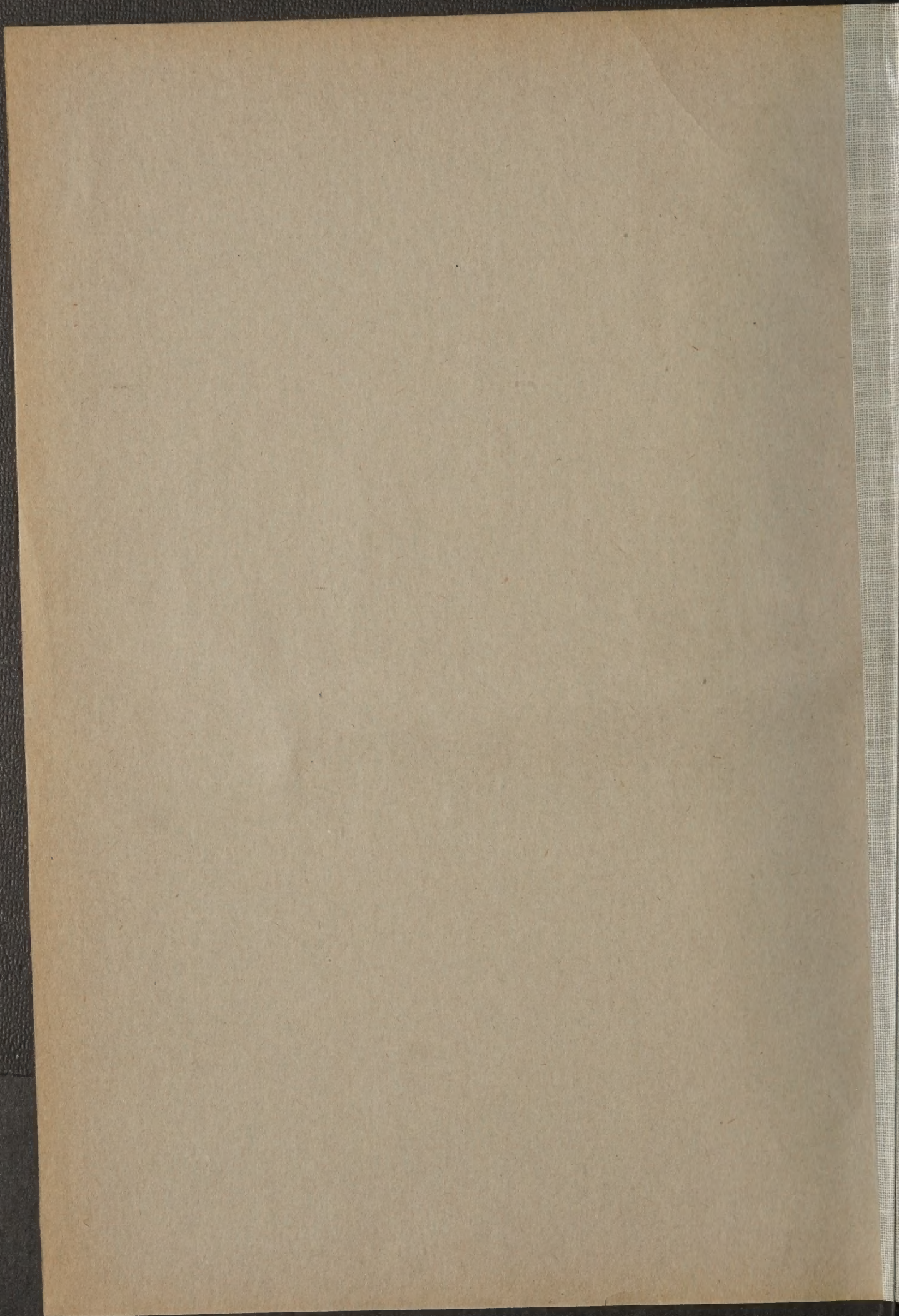
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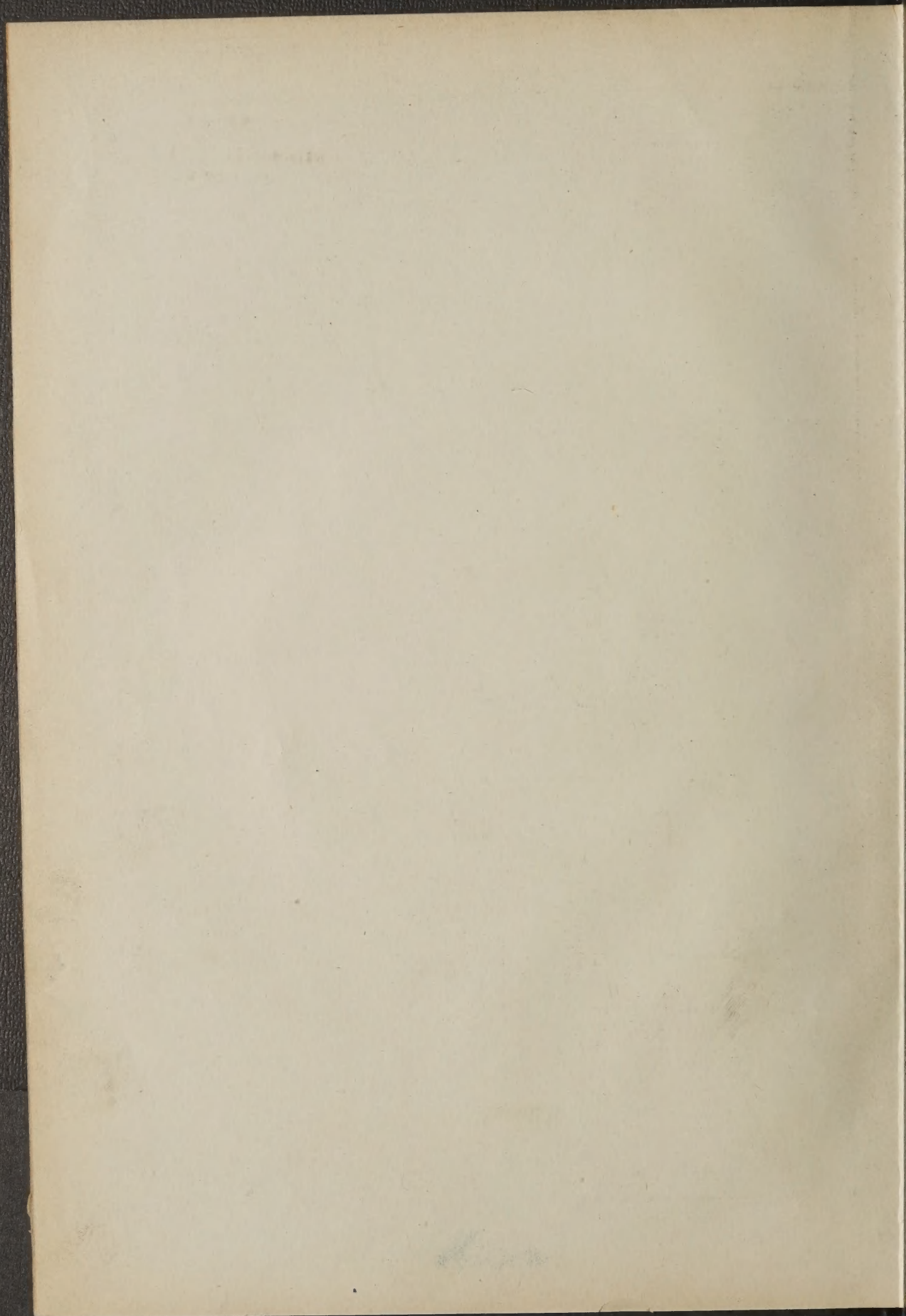
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THE LANCET, JULY 4, 1925.

THE
Croonian Lectures

ON SOME

**DISORDERS OF MOTILITY AND OF
MUSCLE TONE,**

WITH SPECIAL REFERENCE TO THE
CORPUS STRIATUM.

*Delivered before the Royal College of Physicians of
London*

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POLITAN ASYLUMS BOARD.

LECTURE I.*

MR. PRESIDENT AND GENTLEMEN,—It is my first duty to express to you, Sir, and to the Council of the College, the gratitude I feel in being honoured by the request to deliver the Croonian Lectures.

On not a few occasions within recent years the lecturer has selected a subject dealing with one or other aspect of the central nervous system, and for me the choice has been to some extent decided by the fact that for a long time the question of the possible functions of, and the diseases possibly to be assigned to, the corpus striatum has occupied my attention.

Twenty years have elapsed since there was admitted into the National Hospital under the care of Sir David Ferrier (whose house physician I then was) a young woman whose case proved to be the first adequately recognised as belonging to the group known as progressive lenticular degeneration, a disease in which unquestionably the most striking pathological feature is a disintegration of the corpus striatum. The impetus originally given to the study of this part of the brain by the work of a few observers abroad and at home has been vastly augmented during the last decade, till now the student of the subject is like to be bewildered by an unbelievably extensive literature, and has at his disposal a plethora of clinical material, due in major degree to the widespread occurrence of epidemic encephalitis and of sequela of that affection closely resembling paralysis agitans—a reputedly striatal disease.

Notwithstanding the abundant opportunities for investigation thus afforded, finality is far indeed from being reached in respect both of the pathology and the physio-pathology of the symptoms attributed to affections of the corpus striatum, and mere speculation is correspondingly rife. By way of a single illustration, motor symptoms as widely divergent as the complexity of an elaborate tic and the simplicity of a single muscle twitch or myoclonic contraction, as heterogeneous as palilalia and micrographia, are alike set down to striatal disease. Now, the corpus striatum is so situated that traumatic lesions are not calculated to produce any clear-cut picture of its symptomatology; its vascular supply is not derived from a single source; the morbid processes often involving its cell- and fibre-systems (e.g., that of epidemic encephalitis) are not restricted to the ganglia in question; the immediate vicinity of the corticospinal tracts sometimes renders it uncertain, in disintegration cases, whether there is not also concomitant interference with the function of these; even in Huntington's chorea, confidently regarded as a striatal affection because of the outfall of cells in the corpus striatum found with some frequency, every one knows that the cerebral cortex is also simultaneously implicated.

For these and a number of other reasons the ganglia situated in the base of the brain still, to a large extent,

retain the characteristic of basements—viz., darkness. Since hypotheses erected on a still uncertain pathology have altogether outstripped clinical analysis, I have undertaken an objective investigation of various symptoms of a motor order some of which are assigned by many, on insufficient or erroneous grounds, as I shall endeavour to prove, to striatal disease. The need for further analysis along clinical lines is pressing, as will appear in the course of these lectures. The title has been deliberately chosen to avoid giving the impression, which might otherwise be gained, that the clinical phenomena to be considered are in my view and without comment to be set down to striatal disease and to that alone. This study, then, is concerned with the symptomatology of some affections commonly called "striatal," and with some types of movement commonly called "involuntary," as well as with certain problems arising therefrom.

THE SYNDROME OF THE CORPUS STRIATUM.

In 1912, as a result of work on the disease to which the name of "progressive lenticular degeneration" was given, the following syndrome of the corpus striatum was put forward:

"In pure, uncomplicated, bilateral lesions of the lenticular nucleus, and more generally of the corpus striatum, provided they are of sufficient size and of adequate duration, the clinical symptoms are bilateral involuntary movements, practically always of the tremor variety; weakness, spasticity, or hypertonicity (sometimes spasmodic contractions), and eventually contracture of the skeletal musculature; dysarthria or anarthria and dysphagia, and a degree of emotionalism; but without any sensory disturbance, without any true paralysis, and without any alteration in the cutaneous reflexes. If the abdominal reflexes are absent (apart from muscular rigidity), or the plantars of extensor type, then the syndrome is no longer pure."

While subsequent research has fully confirmed the general accuracy of this description, further investigation has filled in certain points then left more or less open, while in other respects, as we shall see, a more ingoing analysis of the symptoms then specified is now required.

In the same monograph the considerable resemblance between progressive lenticular degeneration and paralysis agitans was more than once alluded to, and approximate similarity of the pathology of the two conditions was reasonably surmised. This expectation is now known to have been correct, the essential pathology of Parkinson's disease consisting in degeneration of certain striatal cells and fibre-systems, and of parts of the efferent system of the same ganglion. Since progressive lenticular degeneration is comparatively rare, while Parkinson's disease and the Parkinsonian syndrome are common, we may take the latter as a working example of a mainly striatal malady.

During the last few years a tendency to schematic elaboration of alleged striatal symptoms on an ever-increasing scale has become an unreasonable feature of the literature of the subject, yet the cardinal symptomatology may still be summed up in three words: variability in muscle tone (dystonia), the appearance of "involuntary" movements, and the seeming absence of "true paralysis." As the last of these requires qualification and explanation, we may begin our study with it.

THE "VOLUNTARY" MOTOR SYSTEM.

The term "voluntary," applied to movements, is in constant employment, but of elusive connotation. At a later point we may have opportunity to examine its meaning more closely; suffice it for the moment to say that "voluntary" movements are not *sui generis* in the sense of constituting a class apart; they are equivalent to "least automatic" movements, and all gradations may occur from "most automatic" to "least automatic." In objective characters they are not to be distinguished from other types of movement, equally coördinated and apparently purposeful, from which the element of "volition" is nevertheless wanting. No single criterion of an objective clinical kind (by string-galvanometer

* Lectures II., III., and IV. will appear in subsequent issues.
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methods or otherwise) leads to differentiation; the "will" makes a subjective though not an objective contribution to a movement. Ordinarily speaking, we are in the habit of regarding as "voluntary" those movements which we have reason to believe are effected through the corticospinal or pyramidal tracts, to some extent because in the experimental animal movements (not, as a fact, strictly comparable to those of "volition") can be produced electrically via these tracts. The falsity of this deduction is apparent when we remember the ease with which movements can be electrically elicited from other paths never considered "volitional."

Consciously, we are in complete ignorance of the specific muscular units effecting a "voluntary" movement. Consciousness knows only movements and terminal joint displacements produced by movement, and this has sometimes been taken to argue the representation of movements only in the cerebral convolutions. Evidence will be adduced later which, I believe, disproves the contention. The point at present is, that a very large part of every "voluntary" movement is both "involuntary" and outside consciousness. The expression "voluntary muscular contraction" must therefore be regarded more as a *façon de parler* than a term of differentiating quality.

Similar difficulties follow in respect of the term "paralysis," which is equally vague and open to misinterpretation. The clinician admits degrees of "paralysis," but would have hesitation in defining with precision exactly what they signify. In a given "voluntary" movement the elements of power of muscular contraction, appropriate coördination of muscular units, rate of contraction, accuracy of timing, estimation of amount of contraction required, are among some of the factors in the attainment of a perfect end, and if in any of these the voluntary movement falls short it exhibits in that respect a degree of "paralysis" or "paresis." If a movement is normal except for its unusual slowness of accomplishment there is "paralysis" of normal rapidity of contraction. When, in the definition of the striatal syndrome cited above, mention was made of the "absence of true paralysis," the intention was to endeavour to separate the "paralysis" ensuing on lesions of the pyramidal system from the recognised "motor helplessness" of extrapyramidal cases, in which, as was shown, objective signs of involvement of the pyramidal paths (absence of the abdominal reflexes, presence of the Babinski plantar responses) were wanting. It was then suggested that the discovery of an appropriate expression for extrapyramidal "paralysis" was a desideratum.

As it is, such terms as "weakness," "paralysis," "paresis," and even such apparently more precise expressions as "direct weakness of the motor impulse to the agonists" (Foerster), have, in fact, little if any specificity, however convenient they may be. If the word "paralysis" is indispensable, it may be justifiably employed to indicate imperfection of movement in respect of any of the components of a normal movement, and cannot be confined to questions of muscular strength or power alone.

It became apparent to me some time ago that in order to determine with certainty whether any particular kinds of movement were as a fact impaired or lost in disease of the corpus striatum a complete examination of the motor phenomena from the point of view of normal muscular action of various types would have to be undertaken. The reader of the literature of the corpus striatum will find himself confronted by statements as to loss of movements which in the absence of definitions or expositions are exceptionally confusing. Thus he will be told there is, *inter alia*, "loss of primary automatisms" (C. and O. Vogt), "loss of associated movements" (Foerster), "loss of individual movements" (Jakob), "loss of the associated movements that accompany voluntary movements" (Stertz), "loss of primitive automatisms and of higher coördinations" (Binswanger), "loss of (palæokinetic) automatic and associated types of movement" (Ramsay Hunt), and so forth. (I say

nothing of the attempts to localise these and other motor defects in different sections of the ganglia in question.) Accordingly, a scheme of examination has been devised and applied to a large number of cases, mainly of the Parkinson group, but including also a typical case of progressive lenticular degeneration and a number of choreics of the Sydenham, Huntington, and senile varieties, as well as cases of athetosis. The terms used will be explained as they occur.

CLASSIFICATION OF MUSCLES IN A NORMAL ACT.

A physiological classification of the various muscles taking part in a simple movement of the type called "voluntary" divides them into the following groups: (1) Prime movers or agonists (protagonists); (2) synergic muscles, or synergists; (3) fixation muscles, or fixers; (4) antagonists.

This classification differs somewhat from those of Winslow and Duchenne, and follows the much more recent one of Beevor. For simplicity's sake it may be modified to include (2) and (3) under the one heading of synergists. Thus in the elementary illustration of the movement for closure of the fist the agonists or prime movers are the flexors of the fingers and thumb; the synergists are the extensors of the wrist, while the antagonists are the extensors of the fingers. Beevor showed that in firm closure of the fingers the triceps and biceps act as fixation muscles when a certain measurable degree of contraction of the agonists is attained, and regarded the "fixation group" as fulfilling an essential part in all movements in distinction from the synergists, which he defined as "the muscles which are brought into the combination when a prime mover has, by passing over two or more joints, two or more actions of which only one is required; the synergics are the muscles which neutralise these undesired actions." In the above-given example the synergic muscles, the wrist extensors, serve to obviate flexor deviation of the wrist by the contracting long finger flexors, hence in reality their function is one of fixation. It is practicable, therefore, to include as synergists such muscles as contract (invariably or variably) either to fix joints other than that, or those, actively engaged in the particular movement required, or to enable the prime movers to execute their function with a maximum of effect.

Using the attribute "synergic" in this specific way, I do not speak of "synergic movements" or "movement synergias." In a *whole* movement *part* only is synergic; I shall not use the term to express a complete movement, or a movement concurrent with another. The necessity of this restrictive definition becomes apparent in view of the meaninglessness of any wider application. All the units in a voluntary movement coöperate, even though some may constitute a "coöperation of antagonism," as Hughlings Jackson might have said. If synergy is synonymous with coöperation it is otiose. There is the more need for terminological clarity at this point in that Tilney, whose contributions to a difficult subject deserve respectful consideration, appears inclined to employ the term "synergic unit" to include *all* the muscular components in a given movement—thus eliminating the muscular distinctions drawn above. For the present, however, it will be convenient to keep closely to a classification which has definite clinical merit.

"VOLUNTARY" MOVEMENT IN STRIATAL DISEASE.

(1) *Strength or Weakness of Movement.*

The customary clinical tests of muscular power have been employed in this connexion. They lack absolute value, but they possess considerable relative value if carried out by an examiner of experience, whose subjective standard is based thereon. Various rather elaborate methods have been devised to establish a scale of strength; the only apparatus I have employed has been the dynamometer, the same instrument always being used, and in two ways—either by a succession of grips first on one side and then on the other, or by alternate right and left grips. The most

useful information has been obtained by selecting unilateral Parkinsonian cases, care being exercised rigorously to exclude those in which pyramidal function was not considered normal.

For illustration only three cases need be cited.

1. Left-sided unilateral case.

Consecutive.		Alternate.	
R. 150	L. 104	R. 145	L. 100
144	110	140	100
136	100	140	105
134	114	136	102

2. Right-sided unilateral case.

Consecutive.		Alternate.	
R. 82	L. 98	R. 71	L. 104
84	92	62	90
84	90	82	82

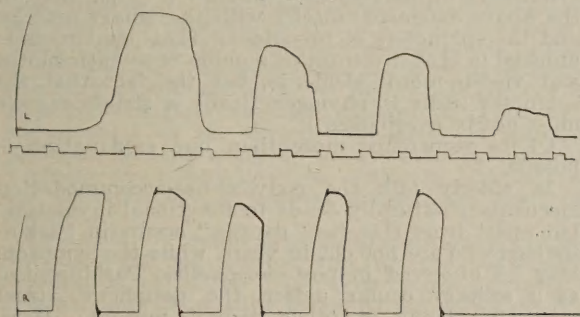
3. Bilateral case.

Consecutive.		Alternate.	
R. 72	L. 48	R. 52	L. 40
65	45	65	42
72	38	42	45

From an analysis of many similar records and a comparison with normal cases the disparity between the two sides in unilateral cases is clearly greater than can be accounted for by the natural right- or left-handedness of the individual concerned, and, also, in bilateral cases the reduction of power, as estimated by the dynamometer, is unmistakable. *The conclusion is that relative motor weakness is to be expected in striatal cases of the Parkinsonian type, varying within wide limits but definite enough.* This is in accordance with the experience of James Parkinson himself, who, in his celebrated "Essay on the Shaking Palsy," mentioned in his definition the occurrence of "lessened muscular power."

Another point brought out by dynamometer records concerns the question of progressive weakening in a series of similar movements. This is stated to be a characteristic of striatal affections, but my observations do not substantiate it; at least, not without some qualification. A glance at the above figures will show that in the unilateral instances similar movements (hand-grasping) are at first relatively better

FIG. 1.



Case of unilateral (left) Parkinsonism. "Voluntary" contractions of right (lower tracing) and left (upper) quadriceps.

sustained on the *affected* than on the unaffected side. Only, however, for a few consecutive "voluntary" movements is this usually found; in a longer series the affected limb undoubtedly tends to weaken more than the other. This is in accordance with the remark of a right-sided Parkinsonian girl, who said: "I could hit anyone hard with the right hand several times quickly, but I couldn't do it slowly, or keep it up." If the arm is actively flexed against resistance at the elbow it eventually tires more readily than the normal. Successive movements of supination and pronation against resistance exhibit a similar tiring. If the patient stands and swings the extended arm in a wide circle from the shoulder reduction of the extent of the swing is eventually visible on the affected side in comparison with the other.

A good way of demonstrating the same phenomenon is by placing the patient in the recumbent position and

getting him to make single consecutive "voluntary" contractions of the quadriceps group on the front of the thigh. The action of gravity is excluded and there is no displacement at the joint concerned, since he is requested not to lift his heel off the couch. From Fig. 1 it will be seen that on the right (normal) side the patient was able to make five successive "voluntary" contractions of the quadriceps in slightly over 11 seconds, the last being as good as the first; on the left (Parkinsonian) side there were four contractions in 12 seconds, and they exhibit a progressive reduction in extent, much more noticeable, however, in the fourth than in the first three. Another tracing from a less severely affected patient (Figs. 2 (A) and 2 (B)) shows five quadriceps innerva-

FIG. 2 (A).

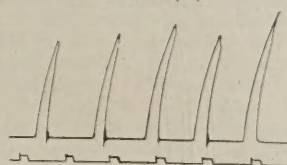
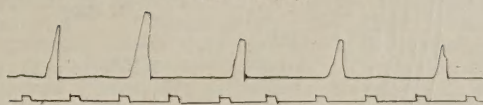


FIG. 2 (B).



Figs. 2 (A) and 2 (B).—Another case of unilateral (left) Parkinsonism. "Voluntary" contractions of right (A) and left (B) quadriceps.

tions ("as quick as you can") in five seconds, all of normal amplitude, as compared with five in eight seconds, very limited in extent, on the affected (left) side.

The records from a well-marked case of unilateral Parkinsonism furnish clear evidence of similar weakness in respect of the "voluntary" movements of the long flexor of the forefinger (Figs. 3 and 4). On the right (unaffected) side the tracing reveals a free, quick, and wide movement of the finger, three consecutive and smoothly coördinated innervations taking place in less than three seconds. By comparison, three similar movements of the left forefinger ("crooking" of the finger) are very slow, extremely limited, and irregular, requiring no less than 17 seconds for their completion.

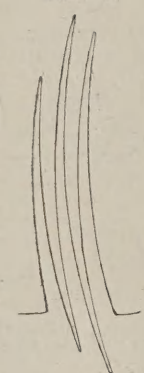
Among the movements particularly apt to exhibit weakness are those of separation of the fingers (interosseal). The Parkinsonian cannot readily "spread" his fingers, feebleness and a certain lack of precision being often seen; nor can he approximate the tip of the thumb and that of each of the other fingers in a quick, strong, and precise fashion. Abduction of the little finger is not infrequently almost nil. Movements of the tongue, too, both inside and outside the mouth, are especially prone to exhibit the same characteristics. It is protruded very imperfectly, and is not infrequently "bitten" in the course of mastication. Speaking generally, the defect is chiefly seen in small-muscle movements, those of larger muscular masses being less obviously imperfect, one reason for which may be simply that gradations of movement are more easily followed by the clinical eye in small than in large muscles, and minor variations of power more easily estimated (see also below).

A further example of this imperfection of "volitional" movement in the smaller muscles is provided by those concerned in phonation and articulation. A common feature of the phonation process in paralysis agitans, progressive lenticular degeneration, and other striatal syndromes is the "mono-tonous" voice. Parkinsonians are compelled to give up singing. As Brissaud said, these patients lose "le chanton du langage," the inflections and modulations which characterise normal pronunciation. Their vocalisation is one long monotone. I asked Prof. E. W. Scripture to take records for me, one of a normal voice and one of a severe case of Parkinsonism selected for the purpose. The latter, I believe, is the first record of the kind that has been taken. The striking

differences between the two can be realised by comparing Figs. 5 and 6. The sentence enunciated in each instance was "I'd like to go home," and while in both the duration was approximately 0.7 seconds, the record of the Parkinsonian is distinguished by complete absence of flexibility, measured in vibrations per second. In other words, here is evidence of imperfection of "voluntary" movement in a well-defined physiological group of small muscles, revealed by defect of range and of flexibility at a quick rate

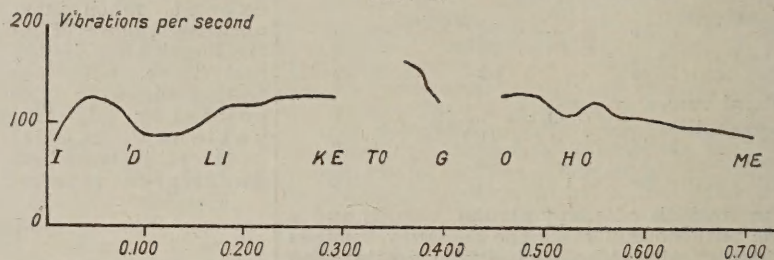
obviously advisable to deal for the moment only with idiopathic cases) reveal inability to converge, one or other eye usually swinging out, or at least failing to move inwards, at the appropriate moment. In one case the patient remarked spontaneously that one of his earliest symptoms was inability to light his cigar, since he could not with accuracy bring the lighted match to the end of it—a convergence-accommodation defect. Peripheral paresis of the internal recti being excluded by the normal participa-

FIG. 3.



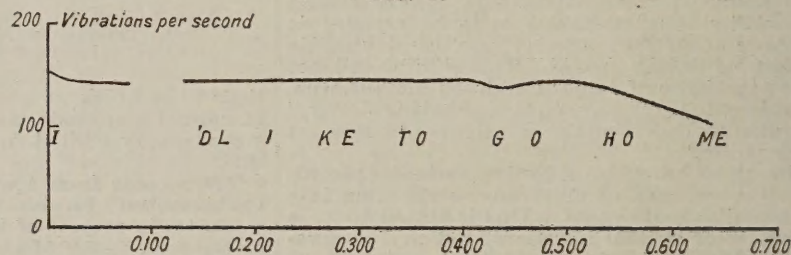
Case of uni-lateral (left) Parkinsonism. Normal "voluntary" contractions of right long flexor of forefinger.

FIG. 5.



See explanation in text.

FIG. 6.



See explanation in text.

(that is, the record reveals the presence of muscular rigidity). To dissociate the quotas of these elements may be somewhat difficult, but in so far as they constitute a departure from normal "volitional" movement of the apparatus in question, they indicate a degree of motor "paresis" in the sense specified above.

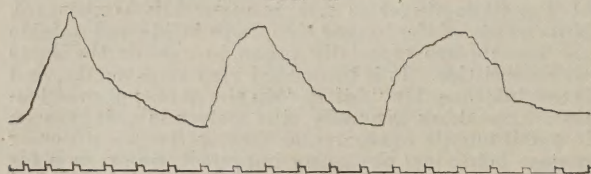
Reference may now be made to the ocular muscles. While as a general rule the external ocular muscles of the Parkinsonian are supposed to exhibit no motor

tion of the muscles in other ocular combinations, we have here a fairly definite "paralysis" of a specific synkinesis or movement-combination—viz., that of the above extrinsic muscles with the ciliary muscles and the sphincters of the irides. (This synkinesis is unusual in that it comprises a union of somatic-motor and visceromotor elements, but the fact that the sphincter iridis is phylogenetically a striate muscle must not be overlooked.)

Of its occurrence more than one explanation is possible.

In elderly folk the convergence-accommodation mechanism naturally tends to functional involution, but apart from this, its "paresis" occurs in Parkinsonians who are not old in years, while the symptom may be observed in post-encephalitic Parkinsonism as a solitary ocular defect, the peripheral visual apparatus being in other respects normal. Here, evidently, is a loss of a particular movement of a set of muscles with preservation of other movements of the same muscles. Hughlings Jackson held there are differences of "evolutionary rank" of movements of the same muscles, and, regarding convergence-accommodation as a very "special" movement, was rather at a loss to account for its retention in ordinary hemiplegia. Curiously enough, he does not appear to have viewed its bilaterality as an explanation for that pyramidal disease; he came, rather, to the conclusion that "convergence, as it has to do with distances, belongs to the locomotor series (cerebellum) and not to the tactual series (cerebrum)." His inference was that the movements of convergence are chiefly represented along with movements of the spine, arms, and legs for locomotion. Distance appreciation is doubtless connected with locomotor functions, but any supposition that the Parkinsonian failure of convergence is linked to the locomotion disorder is perhaps rather far-fetched, interesting

FIG. 4.



Same as Fig. 3. Slow and limited "voluntary" contractions of left forefinger (affected).

abnormality, in a large number of instances a "punctuate" movement of lateral conjugate deviation is seen. The eyes move in a somewhat jerky fashion with fractional pauses at intervals in the course of the deviation. Such "punctuate" movement is, however, by no means confined to cases of the kind we are considering. In some respects it partakes of the nature of the "cog-wheel" phenomenon described below, and is probably to be assigned rather to a disorder of muscle tonus than to weakness of innervation. A more interesting observation is one that has long been a commonplace—viz., defect or failure of convergence. A high percentage of cases of paralysis agitans (and in this respect it is

though such a speculation may be. In a special series of observations I have been unable to satisfy myself that precisely those cases with convergence defect exhibit the most noteworthy disturbance of the "locomotor series." Be this as it may, the frequent impairment of the mechanism under consideration provides further proof of weakness of "volitional" movement in striatal disorder.

Weakness of closure of the eyes is fairly often encountered, especially in post-encephalitic cases. The patient appears unable to "screw the eyes up tightly"; the orbicular muscles usually pass into a state of blepharospasmodic trembling. If the eyes are in fact closely shut for a moment or two he not infrequently seems to be unable to maintain the voluntary contraction tonically. The orbicular muscles of the mouth may act in a similar fashion; the Parkinsonian tends to have his mouth open or his lips apart, and cannot always "purse them up" strongly, as does the normal individual. If he does, he cannot always maintain the tonic contraction.

I attach no little importance to this *weakness of maintenance of contraction*, which, for that matter, can be demonstrated also in other small muscle movements, and is found (as I have shown) in cases of progressive lenticular degeneration as well. It furnishes proof of the inaccuracy of the common statement that Parkinsonian movement is always characterised by slowness of relaxation. Further, it is a clinical symptom the very opposite of that imagined by some to be typical of extrapyramidal disease—viz., so-called "perseveration" or "tonic innervation." I shall return to this question at a later stage.

As far as movements at large joints are concerned weakness is much less noticeable. Movements of trunk, head, and proximal limb segments against resistance are sustained with no little force, nor is restriction of range as a rule in evidence, at least contrasted with that of small muscles. I have never seen actual *loss of movement* of a big joint in Parkinsonism such as may be observed in any recent and severe hemiplegia, or, of course, in any paralytic lesion of the lower motor neurone. If the patient's limb is passively put into a position half-way towards that which he is asked to assume actively, it will often be found to execute the movement with greater power. Thus, if with leg fully extended he is required to flex at the knee, he will accomplish the movement more forcefully should the knee be first passively flexed to a right angle. Foerster appears to claim this phenomenon as an alleged peculiarity of striatal affections, but it is in reality a question of mechanical leverage—the adoption of an optimum position no less characteristic of normal musculature than of diseased.

To decide whether in the striatal affections exemplified by paralysis agitans and its congeners any predilection type of "paralysis" or "paresis" obtains, as we know is the case in pyramidal affections, we have at our disposal data of the varieties illustrated above, and the general conclusion seems justified that *those musculatures whose mass is small are found to exhibit feebleness of "voluntary" contraction, and that, for the body as a whole, this feebleness is in inverse ratio to the size of the muscle or muscles concerned.* A generalisation of this description, however, should not be taken too literally or mathematically, though I believe it to be clinically applicable.

We have seen that in regard to laryngeal, interosseal, facial, glossal, ocular and other small musculatures the contention seems substantiated. In respect of their movements there is found in a large number of instances such lessening or reduction of range, flexibility and quickness of contraction, such fatigability, such imperfect maintenance of contraction (in some instances) as constitute a definite enough "paresis" or "paralysis." When a hemiplegic patient slowly and laboriously extends his fingers we do not hesitate to describe the movement as "weak" or "paresed," and no adequate reason can

be advanced for refusing the same descriptive epithet to the slow, laborious, and limited "spreading" of the Parkinsonian fingers. Dynamometer records prove the existence of muscular weakness in moderately severe striatal cases, hence the non-specificity of the term "paralysis" already alluded to.

With the exception of the ocular musculature—where the defect is largely if not entirely confined to the convergence-accommodation mechanism—the small muscles in the distributions mentioned above are weak for all movements. They are muscles implicated in the execution of the most delicate of acquired movements, especially so in the case of fingers and phonation-articulation apparatus (larynx, tongue, lips); muscles in which fractional gradations of innervation are essential for the production of the finest changes, as in speaking and in precise and exact finger movements. This highly special class of acquired "voluntary" movement, then, suffers more than any other in diseases of the group in consideration, and offers in this connexion no essential difference from what obtains in pyramidal cases, except, it may be, in regard to the speech muscles. These are less likely to suffer in hemiplegia, owing to their bilateral innervation. Consonantly with this, unilateral Parkinsonian cases may exhibit little speech—i.e., phonation-articulation—disorder. The loss of highly specialised, recently acquired movements which Hughlings Jackson thought so characteristic of hemiplegic cases is paralleled by their impairment in Parkinsonian cases. One has only to observe the Parkinsonian fumbling with his buttons or his necktie, or to ask his patient whether he is still able to shave himself, to be assured of this. (Since the advent of the safety razor the argument has been rather "side-stepped.")

The cause or causes of the motor impairment exemplified in this section will be more conveniently discussed after certain other features of the "voluntary" nervous system in striatal disease have been examined.

Micrographia.

Under this same heading of "Strength or Weakness of Movement," the behaviour in paralysis agitans of the fine acquired movements of writing may be appropriately considered. The disturbance of movement known as "micrographia," described years ago by Arnold Pick, but recently resuscitated and alleged to be characteristic of striatal affections by Bernhard, Bing, and others, and indicative of actual paresis by Foerster, deserves remark. The symptom has interested me ever since the appearance of Pick's original paper in 1903 and long before attention was directed more specifically to the corpus striatum. The condition consists, as its name implies, in an obvious reduction in size of the lettering of the writer in comparison with his calligraphy before the development of the organic lesion effecting the change. It is writing in miniature. According to my own observations a distinction should be drawn between the micrographia which is as obvious at the beginning of a sentence as at its close, and that which consists rather in a tailing off into a smaller lettering because of fatigue or other inability to maintain the range voluntarily. In respect of the former variety (to which perhaps the term might be restricted) in my experience it is *certainly neither confined to striatal cases nor in any sense pathognomonic of them.* Bernhard commits a *petitio principii* by confining his researches to cases in which striatal disorder has been evident or presumed. On the contrary, it may be observed in typical form in hemiplegia and other corticospinal conditions. For example, the writing reproduced in Fig. 7 is that of a patient who developed a right brachial monoplegia of cerebral syphilitic origin, from which a good degree of recovery was made. He was a professional mandolin player and complained of two residual symptoms: (1) he had lost all facility in making the fine movements of striking the mandolin strings with his "plectrum," though otherwise he could use the arm with ease; (2) since the "stroke" his handwriting had become unaccountably small in

comparison with his previous style. The loss of the acquired movements of "plectrum"-striking constitutes a limb-kinetic apraxia in Liepmann's sense and definitely suggests a cortical origin for the disorder, while the concomitant and otherwise entirely monosymptomatic micrographia can legitimately and confidently be assigned in this case to disturbance of cortical function. From a case of cerebral arterio-sclerosis the writing seen in Fig. 8 was obtained. It was that of a patient with slight right hemiplegia and slight defect in speaking, and had been noticed since

FIG. 7.

Long live Stoly
God save the King

Micrographia in cerebral (cortical)
neurosyphilis.

dence pointed to implication of the cortex in part of the distribution of the left sylvian artery.

Taking next actual Parkinsonian cases, I have seen many in which severe striatal (or assumed to be striatal) symptoms have been unaccompanied by any micrographic disorder. Thus, the handwriting reproduced in Fig. 9 comes from a typical case of post-encephalitic Parkinsonism of an aggravated sort, the patient being one of the most immobile and rigid I have so far observed. When he was being tested with the dynamometer he did not reveal by a single muscular flicker otherwise the strong effort he was making with his right or left hand, but his calligraphy shows no departure, as far as size goes, from his previous normal. By way of contrast, however, the most pronounced micrographia in my collection is that of a lady who came under observation only a month or two ago, one of the encephalitis cases of the spring of 1924. Her Parkinsonism made its appearance

the onset of the right-sided weakness some months previously. No trace existed of the arterio-sclerotic muscular rigidity often assigned (by Foerster and others) to striatal disease, nor any symptom of a kind that could be referred to the ganglion. On the contrary, the evi-

connexion with disorders of vision and of the muscular sense.

In a paper read in 1916 at the Congress of the Ophthalmological Society of the United Kingdom, and published in their Transactions, numerous instances were adduced of the association of micrographia or macrographia with the visual disturbance of dysmetropsia—the term proposed for departures from the normal either in the minus (micropsia) or the plus direction (macropsia)—and the occurrence of this visual defect at peripheral (lowest), cortical (middle),

FIG. 8.

God save the King
Have you ever seen such

Micrographia in cerebral arterio-sclerosis
(non-striatal).

and transcortical (highest) levels was fully exemplified, cases of hysteria, migraine, and cerebral tumours, of tabes dorsalis and disseminated sclerosis, &c., being selected for the purpose. With these clinical data before us, all that need now be said is that in cortical and transcortical conditions micrographia may be an accompaniment of macropsia, and, *mutatis mutandis*, micrographia of micropsia; or, alternatively, either variety of calligraphic defect may occur without visual disorder (as in the cases cited above). Again, micrographia often is met with where muscular rigidity is insignificant, as in some examples already given, and it may be seen in other instances where kinæsthetic factors have come into play. This latter association is of peculiar interest, for further details in regard to which the paper above referred to may be consulted.

To explain its admitted, if far from constant, occurrence in paralysis agitans and post-encephalitic

FIG. 9.

God save the King God save the King
Good Morning

Normal handwriting in a case of severe Parkinsonism.

FIG. 10.

Have you ever seen such

Micrographia in a case of moderate
Parkinsonism.

in August of the same year, and her micrographia is such as to render her writing almost illegible (Fig. 10), yet, otherwise considered, the symptom-complex in her particular case is of only moderate degree.

For the understanding of this difficult and somewhat involved subject preconceived ideas as to the function of the corpus striatum or its symptomatology in diseased states must be avoided. Micrographia should not be divorced either from its opposite, macrographia, or from the frequent concomitant of macropsia or micropsia. As far as I have noticed, Bing only of recent writers refers to these, solely, indeed, to macrographia, which he calls "megalographia," and thinks is of cerebellar origin. He uses the illustration as an argument for the existence of symptomatological opposites between striatal and cerebellar disease. Recent contributors to the subject have quite failed to take into consideration the variety of cases in which micrographia may occur, and its not infrequent

Parkinsonism, the following questions have to be answered: (1) Is it of transcortical, cortical, or subcortical origin, and (2) is it connected or unconnected with accommodation disorder? To take the latter first: Nearly all of the Parkinsonians with micrographia that have come under notice have exhibited impairment of the convergence-accommodation mechanism, but none of them has complained of the visual disorder I call dysmetropsia. Now our estimation of size can be shown to be regulated mainly by (1) retinal images and retinal disparation, (2) accommodation and convergence "effort," (3) certain psycho-physical factors (distinctness, relative size, light and shade, &c.). Paralysis or paresis of accommodation is often stated to be accompanied by micropsia, and spasm of accommodation by macropsia, but in innumerable instances I have satisfied myself that patients with one or both eyes under the influence of atropine are not aware of any dysmetropic defect, and, further, in many cases of

complete ophthalmoplegia externa and interna no such impairment is remarked. Besides, it is easy to show that in organic and non-psychical cases macrographia, not micrographia, is to be expected with micropsia. For these reasons one cannot feasibly link the micrographia of Parkinsonism to any defect of convergence.

As for the former of the questions stated above, an analogy from this same visual field is apposite. In different individuals the retinal image, retinal disparation, the kinæsthesia of accommodative effort (if there is such a thing), and the psychological factors already referred to briefly are all prominent in widely differing degrees, in the determination of the depth or distance of a visual object, and so of its size. Hence micropsia may result from lesions at one or other of three neural levels or, quite possibly, from lesions involving more than one. In a not dissimilar fashion we may discover the elements producing micrographia to have their anatomo-physiological site at one or other of the same three levels, or at more than one. Accordingly, we must take into account the possibility, as far as concerns Parkinsonian micrographia, of (1) infracortical disorders such as rigidity of antagonists; (2) central ("middle level") dysfunction, such as disturbance of pyramidal innervation for fine acquired movement; (3) "highest level," "transcortical" impairment, such as absence or diminution of the "will" to act, or the condition usually described as dyspraxia. Without further discussion in this place, enough has been said to prove that cortical and transcortical components may have as definite a share in the "lilliputian" symptom under review as those of lower level origin, and that acceptance of the striatal theory, in any exclusive sense, is quite impossible.

(2) Beginning, Course, and Cessation of Movement.

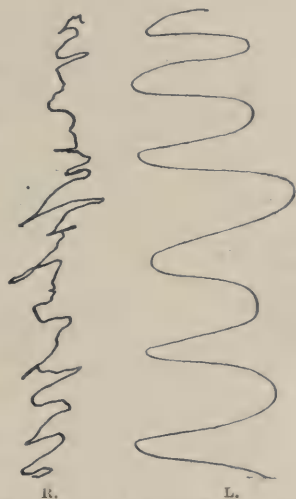
That the Parkinsonian is "slow off the mark" is matter of common observation. Recent measurements with special apparatus for muscular response to a single visual stimulus have given the figures of 0.24 seconds for normal individuals and 0.36 seconds for the subjects of paralysis agitans. With the comparatively simple recording methods which I have utilised myself the feature of slowness in starting and continuing movement has been abundantly exemplified (cf. Figs. 1, 2 (B), and 4). If the patient is at first able to make movements of practically normal rapidity ere long he becomes conscious of retardation. Thus in a well-marked unilateral (right) case the patient made a series of wheel movements of the extended right arm from the shoulder. For three or four complete revolutions the movement was normal, but it then became distinctly slower, the subject remarking spontaneously "it seems to require more effort of my will"; becoming ever slower, the revolutions ceased at the tenth time, whereas on the left they could be kept up indefinitely. Both in a clockwise and counter-clockwise direction the phenomena were similar. Slowness is so conspicuous a feature of all movements of the "volitional" order that it scarcely requires further illustration. It is none the less a variable feature. Apart from the fact already mentioned, that earlier movements may be accomplished in better time than later, the reverse occasionally is encountered, the rate improving slightly after one or two innervations. In all the actions of daily life, dressing, eating, &c., every Parkinsonian admits his unwonted delay in accomplishment. The "drag" is such as on occasion to bring volitional activity almost to a temporary standstill. Coupled with the retardation is a restriction in range and excursion to which allusion has already been made several times, and which is well exemplified in Fig. 11.

In a large number of cases, however, this slowness is more apparent than real, and is so declared to be by the patient himself. The characteristic slow, shuffling, and limited gait, reminiscent of the "démarche à petits pas" or brachybasia of the "lacunaire" or double hemiplegic (in which cases on occasion incidental involvement of the basal ganglia may occur), can be modified in a surprising fashion if

the observer puts his arm inside the other's and invites him to step out. The brachybasia may then easily disappear. A member of our profession, suffering from paralysis agitans, made the curious remark to me that he found he could walk more quickly over the stones of a rocky sea-beach than on the flat, the reason probably being that he was compelled to take longer steps. Parkinsonians often run better than they walk, in this respect presenting an illuminating contrast to tabetics, in whom inability to run while still able to walk is an early sign I have frequently observed. They enter the out-patient room and come to the table with a little run. I have seen a subject of advancing paralysis agitans tuck up his feet and sprint along a garden path when progression at a walking pace was painfully slow. Another patient was actually able to proceed backwards, uphill, at a greater speed than forwards and on the level. James Parkinson gives a graphic description of more than one case in which "the inability for motion, except in a running pace, appeared to exist in an extraordinary degree." As a rule, this power of modification of an apparently hampered musculature is seen more in respect of the lower than of the upper extremities—a corollary, it may be, of the fact that the "voluntary" movements of the former are more, the latter less, "automatic." A remarkable circumstance connected with not a few cases of post-encephalitic Parkinsonism has been the variability in slowness and motor range-reduction at different periods of the day or night, at the instance of extrinsic or intrinsic stimuli, the action of which is far from being clearly understood. (In this connexion similar variability has been reported by one or two writers as taking place under the influence of hypnosis, but I am not in a position to add any personal contribution on this point. Improvement or disappearance of Parkinsonian micrographia under hypnosis has also been recorded.) At a hospital recently I saw a girl, suffering from typical and severe post-encephalitic Parkinsonism, who lay immobile in bed and whose movements in response to my requests were characteristically slow and laboured; yet I was assured her nurses had accidentally discovered that if she was "dumped" up and down on the bed several times in a sitting position she then was able to get up and walk round the ward normally! In the idiopathic disease such peculiar variability is far less in evidence, but if we connect the changeableness in movement described above for the idiopathic patient with the curious though rare phenomena of the post-encephalitic patient, we can only suppose the symptoms to depend less on structural lesions than on dynamic alterations of function, that from time to time innervation is facilitated by modification of the background of muscular hypertonus against which it is ever contending, that the tendency to "involuntary" contraction of the antagonists transiently relaxes. To these matters we shall return later. At any rate, we must concede the possibility of fluctuations in the muscular state greater than a glance at the seemingly immobile attitudes might lead us to imagine.

As for cessation of "voluntary" movement, my observations lend no support to the view according to which the muscles in action in Parkinsonian cases

FIG. 11.



Case of unilateral (right) Parkinsonism. Freehand to-and-fro movement of pencil from above down; L, normal; R, affected side.

may remain tonically contracted, perhaps for seconds, after the "voluntary" impulse has ceased. In no case have I been able to satisfy myself that any condition strictly analogous to "tonic innervation" occurs. By the latter expression is understood inability to decontract, to order or on a signal given, a "voluntarily" contracted muscle or group of muscles. Tonic innervation is of central origin, in the sense that the cases of it I have seen, and those reported by others, have all been due to cerebral lesions, but as far as the actual symptom of inability to relax a contracted muscular group is concerned, no clear clinical distinction can be drawn between it and the phenomenon commonly denominated myotonia. No criterion exists by which to judge when a contraction, "voluntarily" commenced, is prolonged sufficiently to be specified as "tonic," except that if it is maintained beyond the command to relax it is *ipso facto* pathological. Thus understood, tonic innervation in a mild form occurs in many morbid states (moderately severe hemiplegia, athetosis, &c.), but in my experience the phenomenon is so uncommon and uncertain in Parkinsonism as to be practically negligible. If the reader will look at Figs. 15† and 18, taken from cases of advanced bilateral post-encephalitic Parkinsonism, he will find proof of this. In one case, that of a young woman, voluntary action involving the hands and fingers was feeble and tremulous and rather limited in range, but after sustained "voluntary" contraction of the long finger flexors ("close the fist") and, synergically, of the wrist extensors, at the word "open" the long finger extensors instantly contracted and the wrist extensors instantly relaxed—that is to say, neither protagonists (prime movers) nor synergists exhibited any trace of tonic innervation (Fig. 15). In this respect the behaviour of the muscles is identical with that seen in any normal individual (Fig. 14). Similar records have been obtained for the action of trunk and neck prime movers, as well as for trunk synergists in arm movements (cf. Figs. 17 and 18).

(3) Poverty of Movement.

The term "poverty of movement" (*Bewegungsarmut*) has come into vogue to express the familiar symptoms of relative immobility and stationariness of position which are particularly characteristic of the subjects of the shaking palsy. No greater contrast can be imagined than is afforded by the akinesia of the latter, especially in the variety known as paralysis agitans sine agitatione, and the universal fidgetiness of the subjects of chorea. The Parkinsonian scarcely if ever manifests spontaneity in change of position; he literally "sits still." I have for a long time now been impressed by the fact that the average Parkinsonian never sits with his legs crossed, whereas nothing is more frequent in the normal individual than a seated position with one knee over the other. Glancing round the benches at my clinic at King's College Hospital one afternoon, I found 19 out of 20 students sitting in this way. Similarly, the Parkinsonian never sits with his arms folded, though here again is a commonplace change of attitude adopted frequently enough by the normal person. In a score of ways the absence of initiative, of spontaneity, of normal muscular play impresses itself on the observer. Among men a particularly common movement occurs in the course of ordinary conversation—viz., a movement of the hand and fingers to the chin, lips, and lower part of the face, but I have never yet seen a patient with paralysis agitans who has thus raised his hand. Women have a favourite "spontaneous" movement in similar circumstances—viz., toying with their wedding or other ring, but Parkinsonians do not do so. No changing expressions of emotion flit over the face—again providing a striking contrast with what obtains in chorea. This last remark raises an interesting point. Doubtless "spontaneous" movements contain "volitional" and "automatic" elements in inverse proportions—i.e., they are largely

"automatic" and but faintly "voluntary"; on the other hand, change of position frequently results from the action of peripheral stimuli that certainly reach the sensorium, hence a conscious, "volitional," factor is not to be entirely excluded. But emotional expression is essentially "involuntary," so that in the patient with Parkinson's disease we note the absence, or poverty, *both* of "voluntary" motor action and of "involuntary" motor action, at least as far as the expression of the emotions is concerned. I attach importance to this conclusion, and since a "corresponding opposite" is encountered in cases of chorea the point will be referred to again.

Allusion was made above to variability in the course of Parkinsonian movement from time to time, and a similar variability characterises this "*Bewegungsarmut*." On occasion, especially in post-encephalitic cases, the patient appears to exhibit more freedom of movement than at others, and the ordinary "spontaneous" motions of everyday life are more in evidence. From patients of sufficient intelligence and introspection it is possible to gain some insight into the causation of their motionlessness, for I may say at once I consider the subjective factors of no less importance and significance than the objective.

CAUSES OF PARKINSONIAN AKINESIS.

(1) The general akinesia seems to me explicable largely by deprivation of, or serious reduction in, normal impulses to movement, both of the "voluntary" and the "spontaneous" kind. When asked, patients will admit the reduction of the need for or impulse to muscular action. Their "will to act" is impaired. They say in so many words that movement requires a greater effort of the will than previously. Everything is done "with an effort." And the curious thing is the rarity with which they seem to wish to make such efforts; on the contrary, they appear to contemplate this defect of motor function with a philosophical resignation. Those afflicted with the disease complain more of "losing the use" of their limbs, of loss of muscular power and of capacity for executing the ordinary fine movements of every day, than of mere "sitting still." We have seen that they can, as a fact, if they will, perform most of the movements of which superficially they appear incapable, but since this puts a tax on "effort" they simply do not make them.

Spontaneous change of position or posture being mainly a response to peripheral impressions, it may be designated a movement of reaction—a sort of "psycho-reflex" movement, for consciousness is probably faintly stirred. To these sense-impressions the Parkinsonian and the senile (for a similar decrease in motility is natural to the senescent) are alike indifferent, probably for more than one reason. In the case of the former, no evidence suggesting an afferent origin for the impairment is forthcoming; the peripheral nervous system on the sensory side all agree is normal. A questionnaire addressed to a number of intelligent Parkinsonian patients has elicited the answer that they rarely "feel the need" to change position, and this might conceivably be taken to argue for an actual reduction in afferent stimuli, owing to the relative fixity of the limb musculature. The muscles, however, are, many of them, in a condition of contraction; they are not "resting" or relaxed, immobile though the patient be; hence their sensory end-organs must be receiving stimulation. On the other hand, afferents from articular and periarticular tissues are probably to some extent restricted, but I cannot think this has a material bearing on the problem. That the immobility-affecting disturbance of function is not sensory receives support from another consideration.

Akathisia.

There are patients in whom immobility is actually a prominent symptom and yet who complain in a paradoxical way that "they cannot sit still," or only "with an effort." After a time they simply must get up and walk about, immobility having become

† Figs. 14, 15, 17, and 18 will appear in Lecture II.

intolerable; they say they feel "all strung up," or "tightened and screwed up," and so on. In other words, they feel, as does the normal individual, the cramping effect of an unchanging posture and have to move and stretch their limbs at intervals; the accumulation or summation of afferent excitations, derived from a largely motionless (though not resting) musculature, is such that the patient must rise and "work it off," only, however, to sink once more into the same state of motionlessness. Since, then, incoming impressions exist, the reduction of spontaneity in movement must have its origin on the effector side. Since I commenced to observe this phenomenon in the course of my studies more particularly of the last two years, I find that Bing has directed attention to it, and employed the term originally devised by Haskovec—"akathisia"—for cases of inability to "sit still" of hysterical or psychasthenic origin. Bing refers to various authors who have noted akathisia in paralysis agitans and post-encephalitic Parkinsonism, and while not committing himself to one explanation only, seems inclined to accept the view which some others have adopted and which is in accord with that here given. In my opinion akathisia is only an exaggeration of what is seen in normal individuals, and, since it has a psychogenic basis in some instances, it cannot be ascribed in any exclusive fashion to striatal disorder.

At this stage a word of caution must be entered as to indiscriminate use of the term loss of movement in connexion with Parkinson's disease. I have studiously avoided using the term "loss," apropos of reduction of voluntary and spontaneous movement, because I do not consider that the movements are in fact "lost" (with the few exceptions, and these only in part, already mentioned). *Because a patient does not make a movement it does not follow that he cannot.* It is of importance to bear this in mind when we discuss the functions of the corpus striatum at a later point.

(2) As for reduction of "voluntary" activity, the totality of sense-impressions at any given moment being in the Parkinsonian not much different from that of the normal person, we cannot ascribe the inaction to failure of extrinsic stimuli, although these doubtless play a part as one of the springs of action. Intrinsic stimuli, at whose bidding the "voluntary" motor system passes into activity, may perhaps have an ultimate sensory origin, but we cannot express this "impulse" in physiological terms; we know only that our patients say they are not as conscious of it as formerly. It is idle, therefore, to speculate whether such intrinsic stimuli are damped down centrally by a process of inhibition which rarely lifts, or are not forthcoming in adequate amount, or not endowed with sufficient potential. Perhaps this potential has an affective quality, and the "affect-quantum" essential for an impulse to generate action may be wanting. Apart from considerations of this kind the Parkinsonian knows from experience that voluntary movements are no longer effortless and facile, and desists largely of his own accord. Even in respect of this "sense of effort" not a little is obscure. Binswanger, for example, declares that in paralysis agitans "innervation-feeling" is lacking, yet what is signified thereby is not clear. We have already noted the absence of any sensory impairment in the disease, and cannot liken the motionlessness to that of the apæsthetic limb, all of whose dorsal spinal roots have been severed experimentally, as shown by Mott and Sherrington. Nor can "feelings" arising in the course of muscle innervation be lost; Parkinsonian muscles are not at rest. Besides, it is uncertain whether, and to what extent, kinæsthetic impressions can really exercise a stimulant effect, or their relative diminution result in immobility. Once more, no evidence is available to indicate that motor or efferent currents are themselves sensed. According to Titchener, "there is no such thing as a motor-cell sensation, a sensation corresponding to the innervation of a muscle or group of muscles," though Hughlings Jackson himself maintained that "the outgoing current, a motor cerebral current, is concerned with the physical processes during referrals of sensations

to parts of the body"—in any case a view of little bearing on the present point. "Innervation-feeling," therefore, or rather its absence, offers no explanation of the phenomena. I suspect that by a "sense of effort" the patient signifies little else than the consciousness that his muscles no longer "answer," as the rudder "answers" the helmsman's lightest touch at the wheel; and the conclusion, as indicated already more than once, is, that some at least of the akinesia of the Parkinsonian is the direct outcome of unwillingness to move, since the making of movement is no longer effortless.

(3) The objective state of the peripheral motor apparatus is without doubt a factor, yet only one, in this general akinesia. No constant relationship between degree of peripheral rigidity and decrease of spontaneous or "voluntary" movement can be established, for the reason that the motor phenomena under discussion are frequently found where muscular rigidity is not a conspicuous feature. Relative immobility of facies and of limbs is often an early symptom in the disease, sometimes the earliest, before rigidity makes itself obvious. One of the earliest indications of the onset of the Parkinsonian "mask" is notable infrequency of ordinary blinking movements of the eyelids, but in other respects facial movements, "voluntary" and emotional, may still be normal, no trace of rigidity in any facial group being detectable. Reference has not as yet been made to the characteristic attitudes of limb segments in the disease, but it may be remarked here that they develop more or less *pari passu* with the immobility—i.e., it is an immobility in attitude or posture. Now no constant interrelation obtains between rigidity and attitude in the first instance, for the hands and fingers may assume attitudes involuntarily at an early stage when the corresponding muscles are not demonstrably rigid.

As the disease advances, however, a general tendency to muscular fixity becomes ever more obvious, implicating all skeletal groups more or less indifferently. It is due mainly to a hypertonic state of the musculature, an overaction of the tone-effecting apparatus, to which due attention will be devoted subsequently. As a consequence, when the innervating current of "volition" reaches the motor periphery, it finds that: (1) The muscle elements it would innervate are already in relative contraction; (2) the antagonists to the required movement are also in activity. At this stage we shall not pursue the analysis further, for the matter can be more conveniently dealt with in the sections on disorder of muscle tonus. My observations, however, will show that in spite of the background of muscular overtone "voluntary" innervation can accomplish its ends both as regards prime movers, synergists, and antagonists in a given movement, so that the conclusion is permissible that the condition of the peripheral motor system is no more than one of the causes of Parkinsonian akinesia, and not necessarily the most important.

We must beware in Parkinsonian cases of attributing to disease of the corpus striatum symptoms not in fact pathognomonic. A limb may be immobile, or relatively immobile, (1) because the lower motor neurones are "paralysed," as in poliomyelitis; (2) because there exists a combination of innervation weakness and muscular spasticity, as in hemiplegia; (3) because presumably normal innervation encounters a "block" in distal motor mechanisms, as in paralysis agitans (in part); (4) because central "impulses" are wanting, as in the same disease. Under (4) should be included, for the sake of completeness, certain cases of psychosis (catatoniac stupor, anergic stupor, &c.), in which the immobility is psychogenic and partakes of a negativistic character. *In short, akinesia, or poverty of movement, obviously may arise at one or more of lower, middle, or highest physiological neural levels (in Hughlings Jackson's sense), a possibility which renders invalid its ascription to the corpus striatum alone.* Failure to envisage ætiological differences in respect of the development of this symptom, as with others that have already been made the subject of investiga-

tion, has been a fruitful source of confusion; with the exception of Binswanger, most recent continental writers have over-emphasised the "hypokinetic-rigid" syndrome of the corpus striatum at the expense of other clinical conditions of which immobility is a symptom, but which are in no way associated with striatal disease.

(4) Somewhat similar explanations must apply to the general slowness, retardation, and limitation of "voluntary" movement in the disease, as well as to the muscular weakness. Here again a wide conception is indispensable. Allusion was made above to the "motor helplessness" of the subjects of paralysis agitans and of progressive lenticular degeneration, and in my original monograph on the latter disease the facts were fully exemplified. I found that "volitional movements may be good in range, but they are usually resisted with comparative ease. This muscular weakness is not to be confused with clumsiness or awkwardness from hypertonicity or tremor. There is intrinsic muscular asthenia; the patient is incapable of any sustained effort; he cannot close his eyes tightly for any length of time, cannot keep his tongue protruded, cannot maintain his grasp." At that time I endeavoured to avoid the use of the term "paralysis," hoping it might be confined to diseases of the pyramidal system. Further consideration has led me to modify this hope, for *quâ* weakness, limitation, slowness, I see little material distinction between hemiplegic and Parkinsonian cases. The differences between pyramidal and extrapyramidal cases are distinct enough, but not as regards the above points. The general approximation of cases of double hemiplegia, especially of the pseudobulbar variety, to cases of paralysis agitans sine agitatione was emphasised long ago by Hughlings Jackson and again by Brissaud, and in these recent years we have seen examples of post-encephalitic Parkinsonism in which the diagnosis from pseudobulbar palsy has been more than a little difficult.

Having demonstrated the existence, in numerous instances, of such weakness, slowness, and imperfect range of "volitional" movement as constitutes, in Foerster's words, an "unmistakable paresis," I do not agree with him that there is no predilection type. On the contrary, a special class of acquired movements—viz., those of the smaller muscular groups throughout the body—is particularly liable to be affected, as has already been fully exemplified. The small muscles are those employed in what James Parkinson called "any nicer kind of manipulation"; their failure "to answer with exactness to the dictates of the will" is their characteristic in more than one state of motor defect. As a class, they suffer more than any other in hemiplegic cases; derangement or outfall of fine finger movements is seen in hemiplegia, and of laryngeal, glossal, facial, and ocular movements (it may be) in double hemiplegia. In extrapyramidal, as in pyramidal cases, analogous but not necessarily identical imperfection of small movements is to be observed. It is true, as we have seen, that in some instances seemingly as definite "paralysis" of various small muscle activities characterises Parkinson's disease, as it does pyramidal disease; but no one considers the pyramidal morbid state the replica of the other. The rigidities are not identical, nor are the "paralyses"; when, however, we find general resemblances in the types of movement that suffer, we are entitled to seek an explanation that is physiological rather than anatomical. In other words, I do not take the "weakness" of certain movements in striatal affections to imply a concomitant anatomical defect of the corticospinal system, or of similar movements in hemiplegia to be the sequel merely of the corticospinal interruption; in each case the movements are disordered because their physiological quality or character is such that they suffer most and earliest. To account for the "weakness" in paralysis agitans Foerster postulates a second corticomuscular path passing through the globus pallidus and in simultaneous action with the ordinary corticospinal tract in "voluntary" innerva-

tion. To me this hypothesis seems completely unnecessary (apart from its anatomical dubiousness); the rigidity in Parkinson's disease is *general*, but the "weakness" is *special*, and I submit the latter cannot be accounted for merely by anatomical interruption, just as in hemiplegia the special type of motor defect cannot be the outcome merely of a haphazard interference (by hæmorrhage or otherwise) of an anatomical system. In each instance there is defect or loss of *some* movements; in each the same *sorts* of movement are disturbed: behind both instances, therefore, must lie a similar disorder of function, but it is not a similar disorder of structure.

ORGANISATION AND WORK OF A LIGHT DEPARTMENT IN A HOSPITAL FOR SURGICAL TUBERCULOSIS.*

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(TUBERCULOSIS) TO THE LONDON, ESSEX,
AND HAMPSHIRE COUNTY COUNCILS.

THOUGH I have used lamps for light treatment for many years, and indeed had three German quartz mercury-vapour lamps in regular use for a considerable time before the war, it is only since the cessation of hostilities that I have been able to realise a long-cherished wish and have a properly planned and staffed light department. The great interest recently displayed in light treatment and the many requests I receive for assistance from practitioners and institutions desirous of installing apparatus for light treatment are my apology for this sketch of the organisation and work of the light department at Alton.

It may be of some help to those contemplating introducing light treatment into institutions which they serve or administer if I quite briefly outline the reasons which impelled me to establish a light department at Alton and the steps I took to plan and organise it.

Artificial Light Treatment.

First let me state that in this paper by light treatment I mean treatment by light produced by artificial means as opposed to sunlight. The term artificial sunlight I dislike as slovenly and misleading, and though the mercury-vapour lamps I have already alluded to were called artificial mountain suns, I have still to discover any lamp to which such a title can be legitimately or wisely given.

Though light treatment has been extensively scientifically investigated, especially during the last few years, it should be remembered that it owes its origin to shrewd clinical observation and its justification to clinical experience. Fascinating as are theories endeavouring to explain the biological action of light, they still remain incomplete, are sometimes contradictory, and are frequently confusing. Many and wide gaps in our knowledge still remain, and I recognise fully that the scientific principles of light therapy still rest on an incomplete and not too stable basis. I shall therefore confine myself here entirely to practical considerations.

Very considerable opportunities for the practice of sun treatment on an exceptionally extensive scale, both inland and at the seaside, had convinced me of its value in surgical tuberculosis. It was, therefore, natural that one should wish to employ light derived from artificial sources therapeutically.

The Light Department Introduced at Alton.

The cessation of hostilities, the sympathetic approval of the late chairman of the hospital, Sir William Treloar, and the generosity of a private

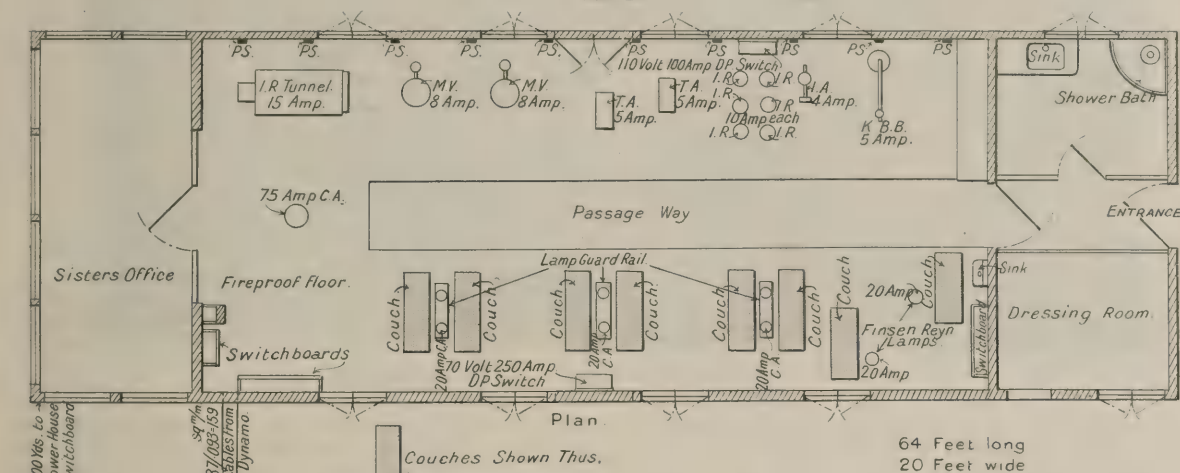
* A paper read before the Electro-Therapeutic Section of the Royal Society of Medicine.

subscriber, gave me the long-desired opportunity of founding a light department.

It is apt to be forgotten by those contemplating artificial light treatment on any considerable scale that this form of treatment is necessarily very expensive. The initial purchase of the lamps is only the beginning and not the end of considerable expenditure. Much electric current must be consumed, the services of a skilled electrician are essential, the plant must be maintained and renewed, experimental work is almost essential, numerous accessories must be purchased, a staff of nurses must be trained, retained, and maintained. Indeed, the lamps are the

The next point to determine was whether a new building for the light department should be erected. Here I felt that it was a safe assumption to make that further possibilities exist and much further investigation is needed. Finality has not yet been reached, and therefore the present light department has been created in an adapted ward which could readily be spared. The present light department must therefore be regarded as probably needing modification and possibly considerable extension at an early date, but, when the time comes for further extension, no building will have to be scrapped, and the ward will revert to its original purpose. Such

FIG. 1.



Ground plan of the Light Department. Couches are indicated on the carbon arc (70-volt) side: they are not shown on the 110-volt side. The iron arc, Kromayer, and Finsen-Reyn lamps are water-cooled; the water, circulating through these lamps, discharges into the sink. P.S.=10-ampère plug and switch. I.R.=Infra-red ray lamps. I.R. tunnel=Radiant heat (luminous rays) tunnel. M.V.=Mercury-vapour lamps (air-cooled). T.A.=Tungsten arc lamps. D.P.=Double-pole switches. K.B.B.=Kromayer type of water-cooled mercury-vapour lamp. C.A.=Carbon arc lamps. I.A.=Iron arc lamps.

least expensive item. Needless to say, this side of the matter was carefully and anxiously considered. I had to satisfy a generous but astute business man in the person of Sir William Treloar, on whom devolved the burden and the responsibility of financing the hospital, that in the interests of the patients under my care the expenditure contemplated, and which would be a constantly and probably increasing drain on the institution, was essential, unavoidable, and justifiable. I would emphasise this aspect, for I am convinced that at this stage an elaborate light department is neither essential nor justifiable for many institutions.

The success which had attended sun treatment gave promise of success from artificial light and made its employment justifiable, the impossibility of obtaining certain results except by artificial light made it essential, and the natural course of evolution in a progressive institution made the establishment of such a department unavoidable. I had absolutely convinced myself of the need before I attempted to influence Sir William Treloar. No hospital for surgical tuberculosis in the country had a properly equipped and staffed light department. For lupus cases especially such equipment was an urgent need. Its value has been thoroughly demonstrated by Dr. Sequeira at the London Hospital, whose brilliant results in the treatment of lupus are so well known. There was no shadow of doubt that numerous cases demanded the treatment a light department alone could give. By the system of heating already employed all the electricity required for the light department could be generated free of cost other than fair wear and tear of the machinery. There already existed an admirable generating plant and a highly skilled and competent resident engineer who could install and maintain the new plant required without additional cost to the institution, and conduct the necessary experimental electrical work requiring investigation.

apparatus as remains of proved utility will simply be transferred to a specially designed building. Meanwhile we are acquiring at a minimum cost experience which will be available later. (Figs. 1 and 2.)

A ward was therefore selected as near as possible to the power-house to reduce the cost of cable. The ward is a simple wooden structure. The necessary cabling, wiring, and installation of the lamps was done by direct labour. To reduce the risk of fire the walls to a height of 4 feet and the floors were covered with sheets of asbestos, which has the advantage of being cheap, non-inflammable, a non-conductor of heat, and, in addition, has a dull non-reflecting surface, so that the patients and staff are not subjected to eye-strain by reflected light. In the power-house a motor generator was erected to break down our existing voltage of 110 to 70. In the trench dug two cables were laid, one to convey the current at 70 volts, the other current at 110 volts for lamps other than the Danish. Each has a main double-pole switch, where it enters the light department, so that the whole current can be instantly switched off in the light department as well as in the power-house should occasion require it. Necessary switchboards with ammeters and voltmeters, fuses, and abundant plugs for the 110-volt circuit are, of course, fitted. All the fittings, metal couches for recumbent cases, and even the mattresses on which the patients lie were made in the institution.

These essential preliminaries having been settled the nature of the installation to be provided and the means to be adopted for training the staff had to be considered.

The Finsen Institute, Copenhagen.

Naturally, the first place to turn to was the Finsen Institute, Copenhagen, and it appeared to me essential to make myself as fully conversant as possible

with the methods of phototherapy employed in this pioneer and famous institution. By the kindness of Dr. Axel Reyn, the director, I was permitted to visit the Finsen Institute and study its methods under his guidance. I would here like to express my gratitude for and appreciation of his generous kindness. He

light in difficult cases, the meticulous cleanliness devoted to the lenses and applicators, the perfect drill, the splendid team-work, and the high degree of perfection of the carbons used as electrodes—these and other details aroused my sincerest admiration. I found that Dr. Reyn and his co-workers pinned

FIG. 2.



One end of the Light Department. Patients having general light baths.

took infinite pains in instructing me in the admirable technique he employs. No detail was too trivial, no difficulty too great. I have the most profound admiration for the technique followed at the Finsen

FIG. 3.



The 75-ampere carbon arc lamp.

Institute, and the success which has been achieved there is a tribute to its thoroughness. The technical skill which has been employed in designing the lamps used, the exact care with which they are used, the ingenuity displayed in the application of the

their faith to the carbon arc for both the general light baths and for local treatment. General light baths with the carbon arc had been used at the Finsen Institute systematically and with success since 1913. The majority of the cases treated were lupus vulgaris. Dr. Reyn has shown that by combining general light baths with local treatment speedier, better, and more certain results were obtained. The use of general light baths was extended to other forms of tuberculosis, but lupus remains the most common form treated.

A second visit confirmed the favourable impressions derived from the first, and I determined that a large part of my light department should be based on the teachings of the Finsen Institute. I followed these to the best of my ability, modifying them where necessary for my particular needs, and copying them carefully where exact imitation was desirable. But another point was firmly impressed on me as the result of my visits. To obtain similar results it would be necessary to have identical apparatus and to employ identical technique. I must have not only carbon arc lamps, but carbon arc lamps as used at the Finsen Institute with Finsen carbons as electrodes, Finsen ideals of thoroughness, and genuine Finsen technique. To secure the last Dr. Reyn kindly arranged that one of the most competent of his trained sisters, a highly educated lady who spoke English fluently, should come to Alton to instruct the nurses in our light department, and, in addition, I arranged for one of our sisters to work at the Finsen Institute in Copenhagen. In each case the visit was of six months' duration and particularly competent sisters were selected. The result of this has been thoroughly satisfactory.

The installation obtained from the Finsen Institute was as follows. Two 75 ampere carbon arc lamps, each capable of treating eight ambulant patients simultaneously; six (i.e., three pairs) of 20 ampere carbon arc lamps for recumbent patients, and three water-cooled Finsen-Reyn 20 ampere carbon arc lamps for local treatment. With such an installation and by following rigidly the adopted technique, I felt confident that successful results could be anticipated, and that confidence has been justified. At the same time I felt that I must not limit my phototherapy to one particular method. Accordingly, I

decided to make provision for testing and employing where desirable any other form of light which seemed of promise.

During the last few years much attention has been paid to ultra-violet radiation, and especially to short-waved ultra-violet rays. Their value in rickets has especially been abundantly demonstrated, their tonic action has attracted much attention. The discovery that the bactericidal power of the blood might be raised after exposure of patients gave alluring prospects. Indeed, the tendency has recently been to use short-waved ultra-violet rays more and more, excluding or reducing the use of the longer-waved rays.

Many so-called artificial sun lamps are rich in short-waved rays never found in the solar spectrum. Makers will often point with pride to lamps which will produce a full erythema dose in three minutes. Such lamps are indeed attractive. They are comparatively cheap, consume little current, have most striking and rapid action, are therapeutically very active, exceedingly short exposures are alone needed and can be tolerated, and they are very easily installed. Accordingly, on my 110-volt circuit I made provision for these, and regularly continue to use mercury vapour, tungsten arc, iron arc, and other lamps. In addition, I have tried several other lamps and numerous electrodes. Many of these have their uses, some are very valuable, especially in certain local conditions, but, on the whole, in surgical tuberculosis, at any rate, they have not come up to expectations. For solid clinical results, as far as I have observed them, I find myself more and more reserving them for the treatment of certain local conditions or even for certain stages in the evolution of local conditions. I admit their value, but had I to choose between them and the various types of Finsen lamps I should at the moment unhesitatingly select the latter.

While many important investigations on the mode of action of light have been completed in the laboratory the subject is so complex, so many factors

tendency to employ them indiscriminately is not devoid of danger. I do not wish to speak dogmatically, for I fully appreciate the value of these rays in many conditions—in some, indeed, their action is remarkable, as, for example, in relieving acute neuritis of

FIG. 5.



Applicators for treatment over muscular areas—e.g., limbs.

FIG. 4.



Finsen-Reyn lamp.

are involved, that I believe clinical experience is still our most reliable guide. When we consider the matter further, this attitude appears to me to be logical. The short-waved rays have very little penetrative power, but have a powerful superficial necrotic action, so that long exposure cannot be tolerated. The total radiant energy introduced into the patient is therefore comparatively small. Caution should be exercised in their use, and the existing

undiscovered origin. How these short-waved rays have acted I cannot tell, but the fact that they have given almost instantaneous relief remains. Nevertheless, until we know more about their mode of action my whole instinct is to be cautious in their employment.

This leads to a very important matter in connexion with light treatment. On the physical side it is possible to produce almost infinite varieties of radiant energy, and to use these rays in a variety of combinations. But while many observations have been made of their biological effects there is so much more to learn that just as you need a bacteriologist or pathologist for ordinary hospital routine so, it appears to me, you need a skilled laboratory worker in connexion with your light department. By the combined generosity of Sir Horace Plunkett and the Medical Research Council I have been able to secure such help in connexion with my light department, and we are fortunate in having obtained the whole-time services of Dr. Bannerman, at Alton, for this purpose in the first light laboratory established in connexion with a hospital in this country. He is checking, investigating, and assisting us by every means in his power, and his work is proving of the utmost value. The result of his observations will be the subject of communications from time to time.

With regard to the actual work of the light department, I have planned arrangements somewhat differently from the Finsen Institute. Experience in the administration of a large children's hospital has taught me the importance of constant and complete responsible supervision. As you will see from the plan, the whole of the light department is visible and readily accessible. There are no cubicles, recesses, or separate treatment rooms, so that the sister in charge has everything always under her eye. In my opinion certainly children and generally adults should never receive light treatment unless under constant trained observation. Children may endanger themselves by playing, they may be faint or sick, they may interfere with and infect exposed wounds, some mishap may happen to the lights, or some unforeseen event may occur. If the ideal of trained supervision is realised, then separate rooms for separate lamps or special

treatment are impracticable unless expense is no object. With children the necessary supervision is comparatively easy. The older boys or girls attend at different sessions. With adults separate sessions for each sex would also be observed or the light depart-

FIG. 6.



Oblong concave and convex applicators for digits or inter-digital spaces.

ment duplicated. At Alton patients are treated behind screens only when their condition is such that privacy is essential, as in such conditions as lupus of the vulva receiving local light treatment.

Two sisters-in-charge are therefore employed. At the busiest period of the day both are on duty. The nurses come on duty at 7.30 A.M. Actual treatment commences at 8 A.M. Local light treatments proceed continuously from that time with the Finsen-Reyn, tungsten, iron and other arcs, and the mercury-vapour lamps, until 7 P.M., with intervals for dinner and tea.

At the conclusion of treatment the department is thoroughly cleaned out, all lamps examined, the

FIG. 7.



For treatment on the under surface of an eyelid. The eyelash is clipped by specially designed forceps.

Finsen-Reyn lamps completely dismantled, each lens individually cleaned, every compressor similarly treated, and everything made ready for the following day. General light treatments with the carbon arcs are held daily from 9 till 11.30 A.M., and from 1.30 till 4 P.M. At each of these sessions six recumbent and eight ambulant patients are treated, so that 28 patients have general carbon arc light baths daily. I agree entirely with the experience of the Finsen

Institute that two and a half hours on alternate days is ample for general light baths for individual patients. Fifty-six patients, therefore, are having such light baths every other day. That is usually sufficient for present requirements. If more general light baths with the carbon arc are needed, an additional session must be held or general light baths with other lamps be given. One 75-ampère arc is always held in reserve and may be used to give supplemental light treatments if needed. (Fig. 3.)

Each patient having a general light bath is provided with a special simple brown paper shade for his eyes; this is cheaper, safer, and much more sanitary than goggles. Each member of the staff has his or her own goggles; convenient specially designed lorgnettes are used for occasional visitors. Each patient is also provided with a clean bathing slip, a clean face towel and bath towel for each treatment, and, in addition, ambulant patients have their own wooden sabots, which are scrubbed after use. During treatment patients are given water to drink. As a general rule, exposure of half an hour per session is given to new patients, increasing from one-quarter to half an hour per session to a maximum of two and a half hours. Ambulant patients face the light, sitting the first half of the session; during that time they frequently amuse themselves by singing or conversation. When their backs are exposed they are permitted to read. They sit as near to the lamps as the heat will permit, the nearer the better, as it will be remembered that the intensity of the light varies inversely as the square of the distance from its source. The current used is a direct current, the positive electrode is above; on the under side of that electrode an incandescent crater is formed, the light is thus thrown down on to the patients with minimum wasted diffusion. During treatment free perspiration occurs, and at the conclusion of treatment each ambulant patient proceeds to the douche room, where he is sprayed with tepid water, dried, and dresses in the dressing-room. Recumbent patients are washed on their stands after treat-

FIG. 8.



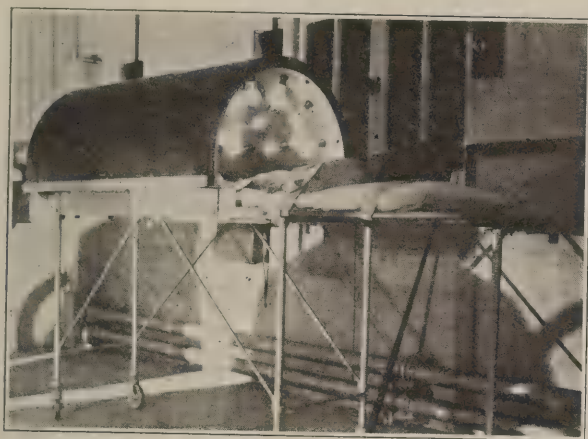
Applicator in position over everted eyelid.

ment, dried, and returned to their wards suitably clad. The sheets over their mattresses are removed and replaced by clean ones before each session. There is thus a considerable amount of laundry work inseparable from light department routine. Recumbent patients are irradiated on conveniently movable stands which we specially constructed at Alton. Adjacent stands are exchanged at half-time during each treatment, and patients are turned so that

each part of the body is equally irradiated, the patient's head being protected from the heat by adjustable asbestos shields. For recumbent treatment three 20-ampère lamps are needed for each two adults, two for each two children.

The Finsen-Reyn lamps (Fig. 4) are only used for the local treatment of lupus. Success with these lamps

FIG. 9.



The tunnel: Radiant heat lamps (tungsten and carbon filament). The patient, on a sliding couch, is passed into the tunnel and cooled during treatment by an electric fan.

depends largely on the skill of the operator and the exercise of scrupulous cleanliness. Great attention is therefore paid to training selected nurses in their use. Nurses are not allowed to use these lamps until they have served three months in the light department and shape well. They are then given progressively difficult lesions to treat. Specially designed compressors are used for different regions of the body, as will be seen from Figs. 5 and 6. These compressors, of varying shapes and sizes appropriate to the part being treated, are each constructed of two pieces of clear quartz mounted in metal. In the space between each piece of quartz, cold water is in continuous circulation while treatment is in progress, during which time the compressor is kept firmly in apposition with the part being treated. The light from the Finsen-Reyn lamp is derived from an automatically-fed scissor-shaped arc, and is focused through a cylinder containing five quartz lenses. This tube, which is filled with pure distilled water, filters off most of the heat rays, and this filtration of heat is continued when the focused light is transmitted through the water-cooled compressor to the lesion. The distilled water in the cylinder is cooled by tap-water kept continuously circulating around it. These lamps are kept continuously in use, with the exception of Saturday and Sunday afternoons, Bank holidays, and during part of the month of August, when the light department is closed down. Fresh distilled water specially prepared and free from particulate matter is put in each cylinder daily. In addition to renewals, as occasion arises every lamp is completely overhauled at regular intervals. Treatment with the Finsen lamp usually occupies two hours for each area treated, but that varies to some extent according to the part involved. Thus, treatment of the under surface of the cocaineised eyelid rarely is practicable or desirable for more than 20 minutes. (Figs. 7, 8.)

By the use of quartz compressors which exsanguinate the part treated much deeper penetration of the light is possible. The light appears to have a selective action on the infiltrated tuberculous tissue. An intense reaction occurs in the area treated, which lasts for several days, exceptionally weeks, and further local treatment on that spot is not repeated until the reaction subsides. It is of very great value

indeed in the majority of cases to intermit the light baths after a period of treatment, this period varying with different patients. If the light baths both general and local are abandoned, say, for about a month and then resumed they are much more effective. Not only is this done, but the patients are then given the advantage of complete climatic change, scene and régime, as I have found that it is of surprising benefit to send the majority for this rest period to Hayling Island. Here during the summer months they may have particularly valuable natural sun treatment, immensely enhanced in suitable cases by graduated sea-bathing. I must not dwell on this point, but I cannot sufficiently emphasise its value. The effect on both the general health and the local lesion is marked.

Lamps other than Carbon Arcs.

In the treatment of surgical tuberculosis by artificial light I would, at present, regard the Finsen side of the light department as of the greater importance, the other as accessory. The value of the other forms of lamps depends to a considerable extent on the skill with which they are used as substitutes for or combined with the various carbon arcs. To these I must briefly allude.

First, I would refer to what we call the "tunnel," which emits no ultra-violet light. (Fig. 9.) It consists merely of numerous filament lamps, carbon or tungsten, gas-filled or vacuum. It is simply radiant luminous heat. The patient, strapped on a stand, is pushed into the tunnel, and there exposed to the light of as many or as few lamps as desired. The heating effect is considerable, but the patient's skin is cooled by an electric fan which can be made to draw the air over him at varying speed. Meanwhile the long-waved light rays, having considerable penetrating effect, warm and activate the blood. The tunnel often provides a useful treatment immediately precedent to that from a short-waved lamp, such as the mercury vapour. Its

FIG. 10.



Treatment by mercury-vapour lamp. Lamp in foreground has carbon filament lamps around to warm patient and activate the effect of the ultra-violet rays.

greatest sphere of usefulness, however, is not in the treatment of surgical tuberculosis, but in certain other conditions.

The air-cooled mercury vapour (Fig. 10) and tungsten arc lamps are so well known and so commonly used that the briefest reference will suffice. For general treatment in surgical tuberculosis they are not so valuable in my hands as the carbon arc. Rapid in their effects at first, their value appears to diminish after a few treatments. They may usefully prepare the way for, or sometimes be suitably used alternatively with, the carbon arc. In surgical tuberculosis they are more valuable for local lesions, sinuses, ulcerated lupus, suppurating or discharging glands, scrofuloderma, and the like. The water-cooled iron arc has a distinct value. It may be used with benefit in local superficial lesions. Its chief merit lies in its cheapness.

Long-waved infra-red rays are of doubtful value. (Fig. 11.) I believe they may be usefully employed for local lesions—e.g., tuberculous hips and knees in patients with low hæmobactericidal power where that is raised considerably temporarily by the use of general ultra-violet light baths. In such cases, while the bactericidal power of the blood is high, they will congest the part and I think in this way hasten the cure. For preliminary local treatment of lupus in regions other than the face, I use on the 110-volt circuit a water-cooled m.-v. lamp of the Kr.

FIG. 11.



Electric radiators for infra-red rays.

type, the value of which has been extended by the introduction of rod-like quartz applicators. The use of these applicators facilitates the treatment of mucous surfaces.

I cannot now discuss the indications or contra-indications for artificial light in surgical tuberculosis, or the results achieved, and must omit many other matters associated with a light department.

One class of patient, however, should be mentioned—the patient who, though needing light treatment, is too ill to be brought to the light department or who would lose more by the movement than gain. For that patient the light department must come to him. By the kind coöperation of a well-known firm I am now engaged in perfecting a lamp specially designed for the needs of such a patient. Such a lamp must have certain essentials. It must be readily portable and simple in application, the ampérage must be small as it will have to be plugged into an ordinary wall-plug, the light therefore must be concentrated on and yet extend the length of the patient. It must be so designed that the light generated can be used effectively and to the greatest advantage. Although certain mechanical difficulties remain yet to be overcome, I hope they will be very speedily surmounted.

It would be invidious to compare the relative merits of different makers' lamps. There are many admirable lamps on the English market to-day which may be safely recommended for special purposes with confidence. The long-flamed arc which has been advocated by and named after my friend Dr. Eidenow, is one in point. It is an excellent lamp, rich in ultra-violet light, and is rightly popular. An excellent arc lamp provided with four pairs of impregnated carbons is now on the market. It is an admirable lamp, economical in first cost and upkeep, and simple to use. It is rich in ultra-violet light, but should be used with discrimination. Indeed, I confess I have misgivings as to the use of powerful sources of ultra-violet light in the hands of the inexperienced.

Work Done in the Light Department.

During the 12 months from March 31st, 1924, to April 1st, 1925, but excluding the month of August, 1924, during which month the department was closed, the following treatments were given to patients suffering from various forms of non-pulmonary tuberculosis. Patients treated for other conditions are not here recorded.

General Carbon Arc Light Baths.

Boys	88	.....	3787 treatments.
Girls	71	.....	2420 ..
Patients	159	.....	6207 ..

Finsen-Reyn Lamp Treatments.

(For the local treatment of lupus vulgaris.)

Boys	20	.....	589 treatments.
Girls	26	.....	768 ..
Patients	46	.....	1357 ..

Other Light Treatments, including Mercury Vapour (Air-cooled) and Tungsten Arcs.

Boys	34	.....	1166 treatments.
Girls	37	.....	956 ..
Patients	71	.....	2122 ..

Total Light Treatments.

Boys	142	.....	5542 treatments.
Girls	134	.....	4144 ..
Patients	276	.....	9686 ..

Conclusion.

As I have confined myself to the title of this communication, I fully realise how incomplete my remarks must appear. It would be desirable to compare the relative merits of sunlight and light produced by artificial means, the indications for their combined or separate use, the advantage of simultaneously or subsequently employing other physiotherapeutic aids, notably aerotherapy, balneotherapy, diathermy, and the like, but that is beyond the scope of this paper. Nevertheless, such matters must be considered carefully in prescribing light treatment; especially should the indications for artificial light and sunlight be borne in mind. I have not the very slightest hesitation in stating emphatically that certain cases derive greater benefit from the one than the other, and others are only given the maximum help by the application of both, often supplemented by other physical aids to cure. Neither have I discussed artificial light therapy in other conditions than tubercle. But this I do say, the light department has been a valuable means of assisting me in the treatment of surgical tuberculosis, and without it much that is now being accomplished at Alton could not be done at all, while much more is very definitely aided.

WAGNER-JAUREGG TREATMENT OF DEMENTIA PARALYTICA.

BY S. GROSSMAN, M.R.C.S. ENG.

(From the Therapeutic Department, Cardiff City Mental Hospital.)

MUCH attention has been recently given to the Wagner-Jauregg treatment of dementia paralytica by the infection of the case with malaria. Very favourable reports have been published in this country and abroad, and we decided to give it a trial at this hospital. Although only eight patients were inoculated, the difficulties encountered and the results obtained are worth recording.

One of the difficulties was to obtain permission from responsible relatives to inoculate the patients with malaria. Unfortunately, the general public does not yet appreciate the meaning of "general paralysis of the insane," and although we have about 30 general paralytics at the hospital, permission was only obtained to inoculate eight of them.

Another great difficulty was to obtain quinine-free benign tertian malarial blood. No such blood was available for a time in Cardiff, and the organism does not often survive when the blood is sent from one

part to another. The opinion of Dr. C. M. Wenyon is that there is no possibility of the parasite surviving unless the blood is inoculated directly into Bass's culture medium, and the tube enclosed in a thermos flask, and so kept warm on the journey. The parasite must also have a certain amount of dextrose, otherwise it dies immediately.

Through the kindness of Dr. John Hartigan, of the Royal Hamadryad Seamen's Hospital, Cardiff, we were enabled to obtain blood from a quinine-free patient suffering from benign tertian malaria. As recommended by Dattner and Kauders, the blood was collected in 0.5 per cent. sodium citrate in physiological salt solution, the dilution being 2 parts of blood to 1 part of the solution. The blood thus obtained was examined by Dr. W. Parry Morgan, city and county bacteriologist, and the parasites in it found to belong to the species *Hæmamoeba vivax* (*Plasmodium vivax*).

One patient was immediately inoculated with the diluted malarial blood, the others being inoculated with blood obtained by venous puncture from a paralytic patient suffering from benign malaria.

Technique.

The technique is quite simple. Two c.cm. of blood were injected under the skin between the scapulæ, and a simple sterile dressing applied. The patient was allowed up, but the temperature was carefully recorded twice daily. The earliest case had an incubation period of eight days; the latest, and perchance the first case inoculated, had an incubation period of 21 days. A microscopic examination of the blood was made whenever a patient developed malaria to corroborate the diagnosis. When the first attack of malaria developed the patient was put to bed at once and isolated. The greatest care was taken to keep the ward free from mosquitoes. The quinine tolerance of the patients was previously ascertained, and in one case the patient refused to take quinine on account of its bitter taste. Euquinine (quinine ethylcarbonate) in 5-grain doses twice daily was substituted for quinine sulphate on account of its freedom from taste. The powder was given in milk.

In the other cases, where the malaria ran an uninterrupted course, we followed the advice of Prof. Pilcz, and after ten attacks checked it; during the first three days by 0.5 g. of quinine twice daily, and then once daily for two weeks. At the same time, a course of neosalvarsan was given intravenously once a week, commencing with 0.3 g. and working up to 0.6 g. One case developed marked jaundice, and another hyperpyrexia with exhaustion. The splenic enlargement was easily reduced by the quinine treatment. There were no deaths amongst the inoculated patients. During the attacks hallucinations and persecutory ideas were manifest in some cases.

Case Records.

The following is a brief description of each case:—

CASE 1.—Duration of disease about 12 months.

Before inoculation patient was exalted and deluded; had very frequent hysterical attacks, during which he became very restless and noisy; it took several nurses to keep him in bed; speech slurred; memory impaired; fibrillar tremor of the tongue; pupils equal, reacted very sluggishly to light. W.R. strongly positive in blood and cerebro-spinal fluid.

Incubation period, 21 days; number of rigors, 10.

Present Condition.—Patient tolerated treatment well, but refused to take quinine. Euquinine had to be given. Physical improvement marked; mental improvement slight. No hysterical attacks since treatment.

CASE 2.—Duration of disease about 12 months.

Before treatment patient very depressed, deluded, and took no interest in his surroundings; occasionally refused food; speech slightly slurred; memory fair; fibrillar tremor of tongue; pupils unequal and fixed. W.R. negative in serum; strongly positive in cerebro-spinal fluid.

Incubation period, 8 days; number of rigors, 10.

During treatment patient was very deluded and hallucinated; after the eighth rigor he became markedly jaundiced, and this lasted until the commencement of quinine treatment.

After treatment patient gradually improved in health and mind; was able to be employed on the gardens until his discharge from the hospital; at the time of discharge he was in good health and quite rational.

CASE 3.—Duration of disease, two years (malaria before admission; Panama before the war, Mesopotamia 1917).

Patient was admitted in June, 1922. He was very confused, entirely disorientated, deluded. Pupils reacted to light; speech not slurred; W.R. negative in blood, positive in cerebro-spinal fluid; cells, 17 per c.mm. Patient's mental condition gradually improved, and he was discharged on Nov. 26th, 1922.

Readmitted on May 29th, 1923: Very boisterous and grandiose, restless and exalted; memory poor; fibrillar tremor of tongue; speech slurred; pupils reacted to light. W.R. strongly positive in blood and cerebro-spinal fluid.

Incubation Period.—Patient did not react to two inoculations at 20 days' interval.

Present State.—Patient is in fairly good health, and in a slight remission.

CASE 4.—Duration of disease, four years.

Before inoculation patient was very exalted and deluded on admission; had ideas of grandeur; memory impaired; pupils reacted sluggishly to light; gait unsteady; speech slurred. W.R. positive in blood and cerebro-spinal fluid.

At the time of inoculation patient was in fairly good physical health, and in a mild remission.

Incubation period, 10 days; number of rigors, 10.

Present State.—Patient tolerated treatment well; was very deluded during treatment; remains deluded and demented; general health improved.

CASE 5.—Duration of disease, five years.

Before Inoculation.—Patient demented and deluded; speech slurred; memory poor; pupils fixed; fibrillar tremor of tongue; health fair. W.R. strongly positive in blood and cerebro-spinal fluid.

Incubation period, 12 days; number of rigors, 1.

Remarks.—Patient became extremely ill during first attack of malaria; temp., 107° F.; very restless, with signs of exhaustion; tepid sponging failed to reduce temperature; an intramuscular injection of 1 gr. of quinine acid hydrobromide was given, and repeated in three hours; temp. gradually became normal, but physical condition of patient did not allow continuance of malaria treatment.

Present State.—Patient's mental condition became worse for a time, but gradually improved; at present patient is demented; his physical condition is fair.

CASE 6.—Duration of disease, two years.

Before Inoculation.—Patient wildly excited and exalted; incoherent; speech slurred; pupils react sluggishly to light; tongue tremulous; gait unsteady; health indifferent. W.R. strongly positive in cerebro-spinal fluid.

Incubation period, 12 days; number of rigors, 10 (not very marked).

Present State.—Patient tolerated treatment well; physical condition improved; gait much more steady; no change in mental condition.

CASE 7.—Duration of disease, 15 months.

Before Inoculation.—Patient deluded and hallucinated; speech tremulous and slurred; memory poor; gait very unsteady; hypertonicity of the whole nervous system; blindness of left eye; right eye fixed; feeble physically. W.R. strongly positive in blood and cerebro-spinal fluid.

Incubation period, 13 days; number of rigors, 10.

During treatment patient was very deluded and hallucinated; ideas of persecution marked.

Present Condition.—Patient tolerated treatment well; gradually improved physically and mentally; at present usefully employed; mental condition good; still under observation at the hospital.

CASE 8.—Duration of disease, 15 months.

Before Inoculation.—Patient was in mild remission five months; speech not slurred; gait steady; health fair; employed in the ward; pupils reacted to light and accommodation. W.R. strongly positive in blood and cerebro-spinal fluid. Since May, 1923, when patient had a series of seizures, he became very confused; speech was slurred; gait unsteady; restless by day and night; frequent seizures; health fair.

Incubation period, 8 days.

Present Condition.—Patient had no rigors; blood did not show malaria parasites; for 12 days temp. raised to 101° F.; tolerated quinine; temp. became normal, but patient became very anæmic; mental condition became worse; bedridden.

General Results (One and a Half Years after Treatment).

Of the eight cases inoculated: (a) Two are in a state of complete remission; one has been discharged from the hospital; the other, who is still under observation, has regained his full power to work, and is quite rational. (b) In two cases the improvement in the physical condition of patients is marked, and in one there is a slight mental improvement. (c) Two cases have not reacted well to the malarial treatment, and their mental and physical conditions remain stationary. (d) In one case it was found necessary to terminate the treatment during the first rigor, as the patient was becoming exhausted. (e) In one case repeated inoculations with malaria were unsuccessful.

Conclusions.

1. The treatment of general paralysis with benign tertian malaria is justified; the technique is simple; the fever can be easily and quickly controlled by quinine. No malaria relapses have occurred.
2. The more recent the case, the better the prognosis; but even late cases improved physically.
3. The remissions are more marked than in untreated cases.
4. An attack of malaria appears to produce immunity to artificial inoculation.
5. Arsenical medication used in any chemical combination only has failed in the treatment of general paralysis of the insane.
6. The Wassermann reaction in the blood and cerebro-spinal fluid, the Ross Jones and Weichbrodt reactions in the latter, remained unchanged. Neither are the cell-contents of the cerebro-spinal fluid influenced by the production of malaria.
7. Even in cases of complete remission some physical signs of general paralysis of the insane remain—e.g., Argyll Robertson pupil; greasy complexion; exaggerated reflexes.

I beg to thank Dr. E. Goodall, medical superintendent, for permission to publish this article.

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MILK-BORNE EPIDEMICS.

By F. W. C. BROWN, M.D., D.P.H. ABERD.,
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MILK-BORNE epidemics of infectious disease, although, fortunately, not very frequent, are events which the existing laws of public health have not been adequate to abolish from our records. The possibility of any of the commoner infectious diseases being spread in a locality through such an essential food as milk, which in great part is taken into the alimentary system in the uncooked state, will always be a source of danger under existing powers. There can be little doubt that milk is the one medium from which we must expect most danger as an infection-carrying agency, being as it is of all food substances the best fitted for the multiplication of pathogenic and non-pathogenic organisms.

The main questions which arise when any milk-producing source is suspected of being responsible for widespread sudden outbursts of infectious diseases are: first, how to determine by absolute proof that the milk is the source of infection, and, secondly, how the public health official is to act in order to put an end to that source. The question of absolute proof

largely depends upon the bacteriologist in the case of those diseases for which a specific organism has been found associated—e.g., typhoid fever. Unfortunately, however, in the case of scarlet fever and some others, we cannot look for any assistance from a bacteriological report. We must gather what evidence is available from such factors as the suddenness or otherwise of the epidemic, and other active causes which are common knowledge and usually quoted by text-books on the subject.

Regarding the greater of the two questions, how is the official to act? The difficulties can be fully appreciated only by investigating an actual case, such as a newly-appointed official experiences when scarlet fever is the disease to be dealt with in a district where the Infectious Disease Prevention Act of 1890 has not been adopted by the local authority concerned. Let us assume, however, that action under this adoptive Act can be taken in the majority of cases. The question of prompt action must be fully appreciated in order to deal not only with an epidemic which is proved to be milk-borne, but with one which is only suspected of being so.

The medical officer probably has his suspicions aroused by the receipt of numerous notifications of a particular disease from the medical practitioners in his district, which on further inquiry show a common milk-supply; possibly one case is located at the farm supplying that milk. Steps may be, or certainly should be, taken to remove the case at the farm forthwith, but the transmission to the milk of the infection also requires serious and prompt consideration to be of any avail. The existing powers held under Section 4 of the I.D.P.A., 1890, give powers to prohibit sale of that milk, but any possible action can only be comparatively slow in comparison with the rapid dissemination of an infective organism. Furthermore, in dealing with a case in which no help towards proof of the milk being infected can be obtained by bacteriology (as with scarlet fever), the action of preventing the sale of the milk may lead to the question of proof in a court of law, should the milk vendor consider it worth his while to so proceed.

It would appear to be time to revise the powers of dealing more promptly and more adequately with this problem.

The Scarlet Fever Epidemic in Heywood in 1924.

The occurrence of an epidemic of scarlet fever in the borough of Heywood, Lancs, in December, 1924, revealed the necessity for prompt and hitherto untried methods of action. The facts which led up to the action taken by the writer may be quoted in the first instance.

Scarlet fever had not been in evidence to any abnormal extent until Dec. 10th, when the occurrence of a case at a farm supplying 180 quarts of milk daily was reported. During the following seven days 49 cases of scarlet fever were notified, the great majority of which had been receiving milk from that farm. The writer located the source of the infection at the farm, and, on visiting there, diagnosed a further case in the farmer's household. Both cases were forthwith removed to hospital and the usual disinfection carried out. Observations at the farm led to the belief that the case had ample chance of coming in contact with the milk stored in the dairy, which was not detached from the main building. The occupants of the household passed through the dairy in order to enter and leave the house. The case discovered was that of a child who was, in fact, seen to be playing with toys in and about the milk store.

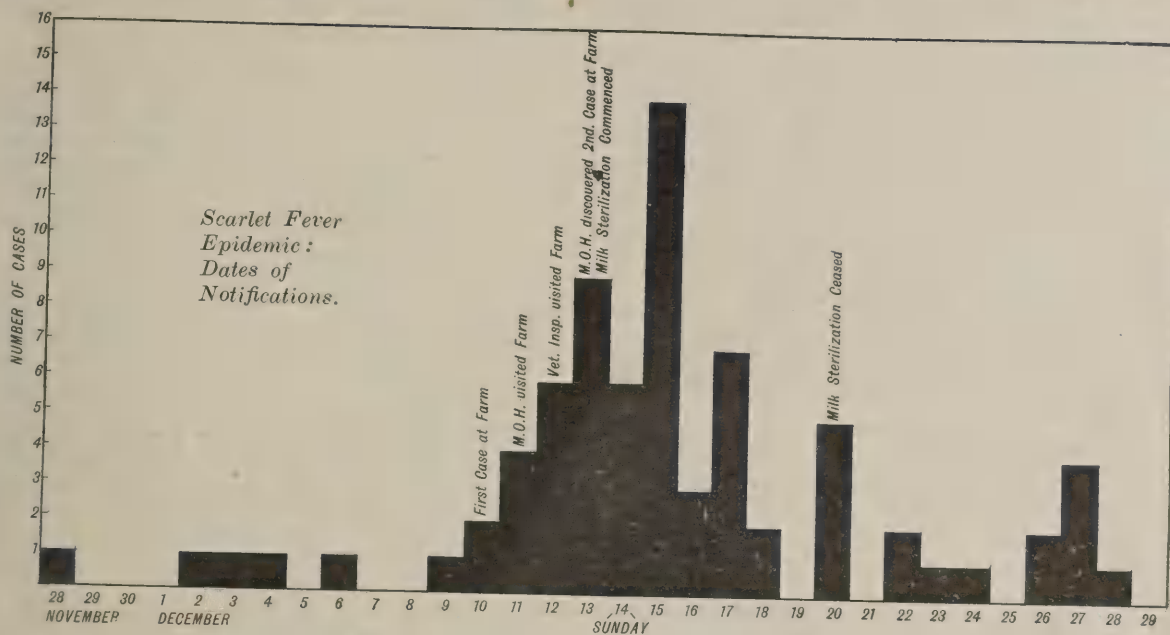
Prompt action was deemed essential. To take steps under Section 4 of the I.D.P.A., 1890, would have entailed some days' delay, and one was met with the farmer's request that the milk be analysed.

It had been the writer's endeavour during 1920 to carry out laboratory experiments on a large scale

on the exposure of certain pathogenic organisms in milk to varying temperatures, in order to further the knowledge necessary for rendering milk free from infection by pasteurisation methods. The results obtained were recorded in THE LANCET of August 18th, 1923, the most important conclusion arrived at being that *B. tuberculosis* in milk was rendered harmless to guinea-pigs when the infected milk had been exposed to a temperature of 60° C. for 20 minutes. During these experiments the thermal death-points of numerous other pathogenic organisms were noted, and in no case did any one of these survive this

being transferred to the milk store ready for sale. In this way a continuous succession of pails were treated, and provided the furnace was fed, no hitch in the operations could occur.

The treatment of the milk was commenced on the day on which the second case of fever at the farm was diagnosed, and was carried out under supervision of the public health staff for the following seven days. By reference to the graph it will be seen that, by allowing an average of three days' incubation period following the first day of this improvised method of pasteurisation, a rapid diminution in the number of



exposure to 60° C. Laboratory experiments, to be firmly established, require confirmatory tests to be carried out in practice in order fully to prove their value to the general public health. The above-mentioned epidemic therefore would appear to be a case for obtaining further proof of the actual value of pasteurisation methods; and although scarlet fever is not one of the diseases to which we can assign a specific micro-organism, yet the writer assumed that the causal organism would not be more resistant to heat than *B. tuberculosis*.

Steps were thereupon taken to carry out pasteurisation of all the milk produced at the farm in question without delay. On my suggesting to the farmer that an attempt might be made to "sterilise" the milk in order not to have his livelihood damaged for a week or two at least by prohibiting its sale, it was agreed to treat the milk by using what apparatus was available for this purpose at the farm. The apparatus consisted of an iron household wash-boiler with furnace below, several five-gallon milk-pails, and an all-glass thermometer.

The method adopted was that, with the boiler containing water kept at boiling point by the furnace, each pail was immersed in the extemporised water-bath and kept there until the temperature of the milk reached 65° C. The period required for the milk to reach this temperature was approximately 20 minutes. The pail was thereupon removed from the water-bath to make way for the next, and was then allowed to remain for 20 minutes in a warm situation. (It was found that by raising the temperature of the milk to 65° C. while in the water-bath, at the end of 20 minutes after removal the temperature had not fallen below the required 60° C.) The pail was then immersed in a trough of running cold water to reduce the temperature as much as possible before

cases occurred. That a sudden fall to zero is not recorded does not disprove the beneficial effect of the pasteurisation. Many of the cases occurring from then onwards were traced to contact with the earliest cases, and consequently arose not directly (although probably indirectly) from the period during which the milk was the infective agent.

Suggestions for Similar Cases.

The experience gained by this epidemic would therefore, in the writer's opinion, seem to point to the usefulness of pasteurisation in dealing with a case in which action more stringent but perhaps more difficult to administer is contemplated.

To consider the better of the two feasible courses of action—e.g., (a) Section 4 of the I.D.P.A., 1890, and (b) pasteurisation—one must view the problem from a wide standpoint. Any action under (a) entails delay through the red tape required by the wording of Section 4; and delay in preventing perhaps 500–1000 persons from consuming even one day's supply of infected milk is a serious consideration. Furthermore, when these powers become operative, the withholding of milk to such a large section of the community without due warning and preparation for their needs is an item requiring thought, especially where infants are concerned. On the other hand, by pasteurisation methods no delay need occur, no inconvenience to the community is entailed, and no hardships are imposed upon the conscientious farmer who may not be altogether to blame for having his milk-supply contaminated through channels difficult to discover. The question of apparatus need not be given much thought, as it is rare not to find in any farmhouse a wash-boiler the dimensions of which are sufficient to allow the immersion of the usual five-gallon pails used in dairy farms.

Clinical and Laboratory Notes.

STRANGULATED OBTURATOR HERNIA; LAPAROTOMY; RECOVERY.

BY WILSON TYSON, M.D.CAMB., F.R.C.S. EDIN.,
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THE rarity of this condition is sufficient excuse for recording a case which I saw recently in consultation with Dr. W. Hotson Palmer, to whom I am indebted for the clinical history.

Mrs. S., 49, a pale, thin woman, whose health had been indifferent for several months, and who had become noticeably thinner, was seen on August 14th, two days after a journey, because of vomiting and slight abdominal pain. She stated that lately she suffered from bilious attacks once or twice a month and was constipated. No abdominal distension and no rigidity; slight general tenderness. On August 20th condition appeared to have improved, and she sat up for several hours. On August 22nd condition obviously worse; facial expression distressed. Severe abdominal pain. No action of bowels after enema, though flatus was passed. Vomiting at intervals. Seen in consultation at 5 p.m. Temperature, 100° F.; pulse, 120. Abdomen considerably distended and tender on palpation. Well-marked ladder-pattern peristalsis. No swelling in femoral or inguinal regions. Rectal and vaginal examination negative. A diagnosis of intestinal obstruction was made, and an operation was performed the same evening, Dr. Palmer kindly acting as anaesthetist.

Operation.—A right paramedian incision beginning just above the level of the umbilicus. On opening the peritoneal cavity some clear fluid escaped. The caecum was not distended, the ordinary hernial sites were explored without result, but a distended coil of small intestine was found fixed, and on being traced down was felt to be attached to the anterior wall of the pelvis. The abdominal incision was lengthened in a downward direction and a good view obtained, when it was found that a coil of small intestine was strangulated in the obturator foramen on the right side; beyond this point the intestine was collapsed. The rest of the bowel was carefully packed off and a gentle but unsuccessful attempt was made to withdraw the strangulated bowel from the foramen. A herniotomy knife was then introduced, and the membrane notched in a downward direction. Further enlargement was obtained by working the tip of the little finger into the aperture and stretching it. Gentle traction on the bowel resulted in reduction of the hernia. There was a well-marked ring of constriction round the bowel at the site of strangulation, but it appeared viable, and on milking the contents from the distended to the collapsed bowel its colour improved. The hernial aperture was closed with two 30-day catgut mattress sutures, the abdomen closed, and the patient put back to bed with the pelvis slightly raised so as to diminish the possibility of anything adhering to the recently sutured area.

Convalescence was uneventful. The duration of the illness previous to operation was ten days; the actual strangulation can only have been of short duration, as evidenced by the viable condition of the bowel.

Ætiology and Pathology.

Obturator hernia is most frequently met with in women who have been losing fat. Out of 63 cases collected by Macready,¹ 59 were in women, whilst of 73 cases collected by Pimbet,² 65 occurred in women. According to Treves¹ the average age is about 60. Hutchinson³ states that only five cases of strangulated obturator hernia occurred at the London Hospital in 20 years, whilst Rendle Short⁴ reports that only one case was met with in 25 years at the Bristol Royal Infirmary.

An obturator hernia follows the obturator vessels and nerve through the upper and outer part of the obturator foramen, and pushes before it the peritoneum, subperitoneal fat, and pelvic fascia. According to Hutchinson³ it presents three varieties: (1) It may come through above the membrane and obturator externus, being covered by the pectineus and adductor brevis; (2) it may project into the substance of the obturator externus; (3) it may pass through a gap in the muscle itself. Relation of vessels and nerve is not constant. Hutchinson³ states that the vessels,

as a rule, are below and to the outer side of the sac. Rendle Short⁴ says cases have occurred in which the artery formed a circle round the neck of the sac. The nerve is generally to the outer side.

Contents of Sac.—The hernia may be preceded by a lipoma, as in a femoral hernia. The sac is usually small, and you may get a Richter's hernia of the small intestine (here the signs of obstruction may not be complete, flatus and even faeces passing). Occasionally by steady enlargement and stretching the sac may contain viscera of considerable size—e.g., the uterus and appendages—a protrusion from the bladder or the vermiform appendix may be present. It may occur in conjunction with a femoral hernia on the same side or it may be bilateral.

Signs, Symptoms, and Diagnosis.

A globular swelling, which may give an impulse on coughing, may be present under the pectineus; it is less mobile than a femoral hernia, has no palpable neck, and occupies a position rather more internal. The thigh may be flexed in order to relax the pectineus, whilst attempts to produce extension cause severe pain; adduction is resisted, as this movement tends to squeeze the hernia against the obturator externus.⁵ Symptoms of pressure on obturator nerve: (a) Shooting or fixed pain referred to the inner side of the knee, perhaps even towards the foot; (b) flexion of hip; (c) weakness or spasm of adductors; (d) impaired sensation in terminal cutaneous branches of the nerve.

H. W. Marshall⁶ records a case of associated pain in the knee and penis.

Vaginal examination allows of palpation of the pelvic aspect of the obturator foramen and may assist in diagnosis. Unless there is a visible swelling in the upper and inner part of the thigh, the condition is rarely diagnosed before death or operation for intestinal obstruction.

Prognosis.

The mortality is high. Treves¹ says that when strangulation occurs the death-rate is nearly 90 per cent. Hutchinson⁷ says that of the five cases operated on at the London Hospital, there was one recovery. Firth, quoted by Hutchinson, states that five cases were saved out of 25, whilst Auerbach gives 11 recoveries out of 25 cases. Probably with modern operative methods and less reluctance to submit to operation the percentage of recoveries will be greatly increased.

Treatment.

There are three methods of approach: (1) Abdominal, (2) femoral, (3) combined abdominal and femoral. Opinion has come round in favour of the abdominal route, and in the performance of this operation the following points may be noted. A powerful illumination and the Trendelenburg position are of great assistance. It is easy to close the canal by a purse-string or by mattress sutures, as the peritoneum is loose at this site. For this reason, as Rendle Short⁴ points out, another sac may form; to avoid this, he resected a piece of rib cartilage and inserted it into the canal, drawing the peritoneum over it by a purse-string suture. A lateral incision with the herniotomy knife should be avoided on account of the vessels. If the hernial sac contained firmly adherent intestine or omentum, it might be necessary to combine laparotomy with exploration from the thigh. The risk of recurrence after operation has already been mentioned, and Van Zwalenburg⁸ records a case of fatal recurrence six years after operation for radical cure.

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5. Beesley and Johnson, p. 411.
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7. Hutchinson: Hernia, p. 170.
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A CASE OF
THROMBO-ANGIITIS OBLITERANS OF
TWENTY-TWO YEARS'
DURATION.*

By F. PARKES WEBER, M.D. CAMB., F.R.C.P. LOND.,
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THE patient to whom this note refers was shown by me at the Clinical Section of the Royal Society of Medicine on Dec. 13th, 1907,¹ and was described in detail in THE LANCET for Jan. 18th, 1908, under the heading Arteritis Obliterans of the Lower Extremity, with Intermittent Claudication ("Angina Cruris").² It was not till later in 1908 that Leo Buerger of New York³ introduced the term "thrombo-angiitis obliterans"—the term that is now generally used for this kind of arterial disease.

M. M., a Russian Jew, aged 60 years, who came to England at the age of 25, was seen by me first in May, 1906. The symptoms had commenced gradually in 1902 or 1903 at the age of 38, with pain in the left foot on walking, of the nature of intermittent claudication. The disease progressed by exacerbations from time to time, but there were prolonged periods of quiescence, with remission or absence of pain. In 1916⁴ both lower extremities showed typical erythromelalgia-like symptoms, as well as intermittent claudication and absence of pulsation in the dorsalis pedis arteries. No amputation had been performed, although the patient had passed through periods of very painful ischaemic ulceration, when gangrene seemed imminent. During one of these periods the pain, especially at night, which had commenced with slight ischaemic ulceration in one foot, lasted so long, in spite of treatment and rest in bed, that my house physician could not understand why the patient did not demand amputation as the only possible remedy. The case had been furthermore complicated from time to time (1909, 1910, 1914, 1915, 1916) with multiple foci of superficial (sometimes "nodular") phlebitis, such as has been often observed in other cases, notably in many of those described by Leo Buerger.⁵

In 1915 the patient developed a tender localised swelling in the position of the radial artery at the right wrist. Subsidence of this swelling was accompanied by apparent obliteration of the arterial channel, as evidenced by loss of pulsation. The swelling in question was seemingly due to thrombo-arteritis, and clinically analogous to the swellings which occur in nodular thrombo-phlebitis of superficial veins.

Of late the thrombo-angiitis in this case has been non-progressive, but in May, 1924, the patient was temporarily in hospital for what I regarded as a mild attack of gout at the base of both big toes. I found then to my astonishment that there was again fairly good pulsation in the left radial artery at the wrist.⁶ With small doses of sodium salicylate and sodium bicarbonate the gout soon subsided, but there were also signs of chronic interstitial nephritis with high blood pressure. The urine contained a little albumin and a few granular tube-casts. The brachial systolic blood pressure was on the left (apparently sound) side 192 mm. Hg; and on the right side it was 185 mm. Hg. The painful intermittent claudication had compelled the patient to follow a sedentary mode of life which was doubtless associated with relative excess of food, and this combination had probably favoured the onset of gout and chronic interstitial nephritis. When I saw him again in March, 1925, he complained of vertigo. The urine contained a little albumin and a few hyaline and granular tube-casts. The brachial systolic blood pressure on the left side was 210 mm. Hg. It should be stated that the blood pressure in each arm had formerly (1907) been 135 mm. Hg. He still has typical intermittent claudication of both lower extremities. There is a curious network of dilated superficial venules on the back of both feet.

Family History.—The family history in the present case is remarkable. A son, aged 20, and a daughter, aged 18, both died in 1920 with diabetes mellitus. Another son formerly suffered from bronchitis and asthma. Another son, S. M., now aged 32, has been known to me since July, 1911. He formerly had a slightly enlarged spleen and used to suffer from recurrent attacks of headache and vomiting. A daughter (N. M.), of that son (S. M.), when she was 12 months old (1922), suffered from typical recurrent attacks of Raynaud's syndrome.⁷ Her Wassermann reaction and the Wassermann of her father (S. M.) were negative.

* Case shown at the Clinical Section, Royal Society of Medicine, May 8th, 1925.

The Wassermann of the present patient (the grandfather, M. M.) was examined on various occasions and was always found to be negative. Sugar was never found in his urine. There has been no evidence of saturnism. He used to be a rather free smoker of cigarettes, like nearly all patients affected with thrombo-arteritis obliterans, a disease which in London as well as in New York is found to be almost exclusively confined to Hebrews of the male sex, who themselves or whose parents have immigrated from Central Europe. Only four out of 500 cases collected by Leo Buerger did not belong to the Semitic race.⁸

I would add that at the German Hospital during the last two years a leg has been amputated in two bad cases (both Hebrew men) of thrombo-angiitis obliterans. In one of these cases, M. G. L., aged 43,⁹ microscopic examination of the anterior tibial artery and the surrounding tissue in the amputated lower portion of the (left) leg showed a very remarkable perivascular and perineural inflammatory cell-infiltration. For this finding I am indebted to Sir Frederick Andrewes, who very kindly sent me a report of the microscopic examination. He agreed with me that this cell-infiltration might perhaps represent an ascending perivascular lymphatic inflammation, which had travelled up from a septic inflammatory focus in the foot. It certainly reminds me of the fibrotic "matting" around the vessels (due to old chronic perivascular changes), described by Leo Buerger as having been found in some of his cases.¹⁰

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2. Same author: THE LANCET, 1908, i., 152.
3. Leo Buerger: Thrombo-angiitis Obliterans—a Study of the Vascular Lesions leading to Presenile Spontaneous Gangrene, Amer. Jour. Med. Sci., Philadelphia, 1908, cxxxvi., 567.
4. See the article by F. Parkes Weber on Thrombo-angiitis Obliterans or Non-syphilitic Arteritis Obliterans of Hebrews, Quart. Jour. Med., Oxford, 1916, ix., 289.
5. Leo Buerger: The Circulatory Disturbances of the Extremities, 1924, p. 317 and elsewhere.
6. F. Parkes Weber: Return of Pulsation in Thrombo-angiitis Obliterans, Brit. Med. Jour., 1924, ii., 62.
7. Same author: Raynaud's Syndrome in a Non-syphilitic Infant, with a Remarkable Family History, Brit. Jour. Child. Dis., 1923, xx., 25. Since 1922 the child has been quite free from Raynaud's disease.
8. Leo Buerger: Op. cit., p. 277. See, however, E. D. Telford and J. S. B. Stopford: Thrombo-angiitis Obliterans, Brit. Med. Jour., 1924, ii., 1035.
9. The history of this patient had been previously recorded by Dr. Geoffrey Evans, Proc. Roy. Soc. Med., Clin. Sect., 1923, xvi., 12.
10. Leo Buerger: Op. cit., p. 320. He writes that during the stage of organisation or healing there is a development of fibrotic tissue in the adventitia, that binds together the artery, vein, and nerves.

Messrs. J. and A. Churchill announce the early appearance of a new edition, with eight new coloured plates, of "Medical Ophthalmology," by Mr. R. Foster Moore, F.R.C.S.; a second edition of "Recent Advances in Medicine," by Dr. G. E. Beaumont and Prof. E. C. Dodds; and a new work entitled "The Diabetic Life: Its Control by Diet and Insulin," by Dr. R. D. Lawrence, chemical pathologist to King's College Hospital.

REMOVAL OF BETHLEM HOSPITAL.—The House of Lords passed the second reading of the Bethlem Hospital Bill, which provides for the removal of the hospital from its present site in the borough of Southwark to the Monks Orchard Estate at Addington in Surrey and Beckenham and West Wickham in Kent, and for the disposal of the existing buildings and convalescent home. Lord Southwark, having expressed a hope that the site might be preserved as an open space, Lord Burnham pointed out that if it was needed for public purposes a commercial price would have to be paid for it, otherwise provision for the insane would suffer. The London County Council have since decided to petition against the Bill on the ground that the utilisation of the site ought to be the subject of a scheme approved by the Minister of Health. It is urged that the land is needed for housing, recreative and educational purposes, and that the Bill in effect repeals a clause in the Bethlem Hospital Act of 1901 forbidding the letting of the site for a term of years "for building or for any other purposes."

Reviews and Notices of Books.

THE STOMACH AND UPPER ALIMENTARY CANAL IN HEALTH AND DISEASE.

By T. IZOD BENNETT, M.D. Lond., M.R.C.P., Assistant Physician to the Middlesex Hospital; Physician to the Royal National Orthopaedic Hospital. London: William Heinemann. 1925. Pp. 344. 21s.

IN his preface the author justly alludes to the scarcity of modern books by English authors dealing with the disorders of the upper alimentary tract. And yet from his references to the literature (which includes some valuable contributions of his own) it is clear that the study of these disorders suffers no neglect in this country. The difficulty of presenting so vast a subject in a form which shall be both clear and comprehensive, and which shall embody the essentials of modern physiological and pathological teaching, has presumably acted as a deterrent to others. This difficulty the author has attempted, with no small measure of success, to overcome. He has brought to bear on the clinical problems of digestion a wealth of physiological experience, and by his familiarity with the work of his dental, radiological, and surgical colleagues, and with the needs of the student, he has avoided the imputation of producing a book of too specialist a character.

The chapters dealing with the stomach give a concise and clearly reasoned account of the present position of our knowledge of the pathology of peptic ulcer; of the disorders of gastric function dependent on organic disease; of the early diagnosis of carcinoma ventriculi; and of the scope of radiography, gastric analysis, and other laboratory investigations. Dr. Bennett is an advocate of the fractional test-meal, and his researches with the method lend authority to all his statements on gastric chemistry. A full description is given of the Sippy treatment of gastric ulcer, and while many will hold that equally good results may be obtained by less elaborate measures and that the treatment is not always well tolerated, the author claims to have employed it with satisfactory results. An account of the toxic alkalosis, which may occur in cases with commencing pyloric stenosis or renal inadequacy, should perhaps have been included. The list of indications for surgery in gastric and duodenal ulcer is most reasonable, and should give guidance to the general practitioner, whose difficulties have been increased of late by recurring disputes concerning the respective merits of surgical and medical treatment. The author asks us to hold him responsible for the opinions expressed in the book, but his general outlook is so sane and well in accord with current teaching that there is small room for disagreement. We think, however, that he somewhat over-emphasises the rarity of chronic gastritis, for is not this condition present in the majority of alcoholics, in many patients with bad pyorrhoea, and in all cases of acne rosacea? On the other hand, undue prominence is given to gastric syphilis, of which the proved cases are few.

The later chapters on diseases of the gall-bladder, liver, and pancreas contain some interesting views, especially in regard to paths of infection, and include reference to the work of Meltzer and Lyon and the indications for duodenal intubation, together with some helpful remarks on treatment. The earlier chapters, with the important exception of dental sepsis, add little to the accounts of the diseases of the mouth, pharynx, and oesophagus to be found in many of the modern text-books of general medicine.

If there is one major criticism of the book it is in relation to the poverty of its clinical description. Although the author is careful to insist on the importance of the interrogative and clinical overhaul, subjective symptoms—upon the interpretation of which all diagnosis of alimentary disease must in the first instance be based—receive too scant a reference.

While it is essential that the student and practitioner should have an understanding of laboratory method and that they should appreciate its uses and limitations, it is equally essential that they should become more rather than less familiar with the early subjective and objective evidence of disease as seen at the bedside or in the consulting-room. A clearer statement of the indications for a "complete investigation," after the manner of the "indications for surgery," would enhance the utility of the book. The literary presentation and general arrangement of the volume is excellent; the illustrations (with the exception of the rather indistinct radiogram facing p. 181) and the diagrams are good; and there is a useful bibliography at the end of each chapter.

The book has no English competitor at the present time, and well-earned success may be anticipated for the volume, which will require subsequent issues to keep pace with our developing knowledge.

Diagnostik und Therapie der Magenkrankheiten. Eighth and ninth editions. By Prof. Dr. I. Boas, Berlin. Leipzig: G. Thieme. 1925. Pp. 817. R.M.42.

THE practitioner who has little German will probably hesitate before attempting to ingest the contents of this apparently verbose and weighty tome; but if he persists he will be amply rewarded for his effort. This text-book has long been a standard German work on diseases of the stomach, and it has been considerably enlarged and to some extent rearranged. The first half is devoted to general examination and methods of treatment; under the latter the author recommends the dry expression of the stomach contents in certain cases. In the second half some 450 pages are devoted to special diseases of the stomach. The book is well illustrated, and includes some rather intriguing coloured charts, which demonstrate the chemical contents of the more common foodstuffs and beverages; under the latter seven kinds of beer are analysed.

DIETETICS.

1. *Food and the Family.* By V. H. MOTTRAM, M.A., late Fellow of Trinity College, Cambridge; Professor of Physiology in the University of London. London: Nisbet and Co., Ltd. 1925. Pp. 240. 5s.

2. *Food Values.* What They Are and How to Calculate Them. Third edition. By MARGARET McKILLOP, M.A., M.B.E., Fellow of King's College for Women, London. London: George Routledge and Sons, Ltd. 1925. Pp. 152. 3s. 6d.

3. *Diet in Health and Disease.* Sixth edition. By JULIUS FRIEDENWALD, M.D., Professor of Gastro-Enterology, and JOHN RUHRÄH, M.D., Professor of Diseases of Children, University of Maryland School of Medicine, Baltimore. London and Philadelphia: W. B. Saunders Company. 1925. Pp. 987. 37s. 6d.

(1) Prof. Mottram writes in a pleasant style, and although his little book is definitely intended for the lay reader it will prove interesting even to the scientific dietitian. After an account of what food can do in promoting and maintaining health, there follows a chapter in which various food views are discussed from the physiological standpoint. Chapter III. deals with the nature and functions of food, and in popular language the various constituents of food are explained and discussed. This leads on to the question of food as an energy producer, and here we meet the calorie for the first time, when Prof. Mottram is at his very best. The calorie value of various foodstuffs is discussed, and even those who, like the author, as he amusingly confesses, cannot do simple arithmetic will not find this section either difficult or boring. The food budgets of the professional man and of the working man are analysed, and the originality of the book lies in the way in which the cost of food is considered in view of the calorie value obtained.

Fresh herrings head the list for the cheapest way of obtaining a daily animal protein ration for only $2\frac{3}{4}d.$, and a subsistence diet of over 3000 calories can be obtained from fresh herrings, oatmeal, and cabbage, which costs only $5\frac{1}{4}d.$ a day and yet contains all the physiological requisites! This rock-bottom diet serves as a background for criticism of food in general. The egg as a cheap food is exploded completely, for it appears that eggs are dearer than any other given food for proteins and dearer than most familiar foods except cod and sole for calories, while the vitamins contained in eggs can be obtained more cheaply in other ways. This is an example of how the subject is treated by one who seems to know as much about housekeeping as he does about physiology, and this is high praise. There are a few minor points which may be criticised. "Acidity" of the blood, even when the offending word is put between inverted commas (p. 86), is not a good term, and if "rarely met with outside the walls of a hospital" is never met with inside. To say that cod-liver oil will alter "the state of a child within a few hours from dullness and disinterest in food to playfulness and a good appetite" (p. 99) is surely exaggeration, and the statement that "all children brought up on dried milk need a teaspoonful or two of orange or tomato juice per day" (p. 106) is a little dangerous and vague in view of the fact that even this quantity will fail to prevent scurvy in some cases; in a book intended for the lay public the minimum should be set higher. We commend the book to all interested in the subject, and this is a very large section of the public.

(2) To those who are reading Prof. Mottram's book, "Food Values" will prove useful for the tables it contains. Since its first appearance in 1916 the author has had much practical experience in the Ministry of Food during the war, and consequently much of the present edition has been rewritten, the most important change being the substitution of English analyses of food for American analyses. The preliminary part of the book contains an account of food requirements, a whole chapter is devoted to vitamins and another to the brown bread controversy, while the greater part consists of tables of food analyses, dietary requirements, and daily diets.

(3) "Diet in Health and Disease" is in quite a different category from the other two books here under review. It is essentially a reference book to meet the needs of the medical profession, and contains a full treatment of the whole subject of food analysis and food requirements, while the bulk of the work is taken up with an account of suitable diets for use in disease. The first edition appeared in 1904, and since then the book has been constantly revised, so that the sixth edition not only differs considerably from the first, but also from the fifth and contains many additions, while many sections have been rewritten. For example, changes in the sections on food poisoning, on diabetes, on coeliac disease, and on nephritis have been rendered necessary by the progress of medical science. The authors claim that dietetics may now be regarded as probably at least half scientific and half empirical, but a perusal of this book, with its many tables, gives the impression that this is a modest estimate. Not a few of the dishes discussed are unknown in this country.

DIATHERMY IN GONOCOCCAL INFECTION.

Treatment of Gonococcal Infection by Diathermy. By E. P. CUMBERBATCH, M.A., B.M., B.Ch. Oxf., M.R.C.P., Medical Officer in Charge of the Electrical Department of St. Bartholomew's Hospital; and C. A. ROBINSON, M.B., B.Ch., D.M.R.E. Camb., Medical Officer in Charge of Electrical Department, West Middlesex Hospital. London: Wm. Heinemann, Ltd. 1925. Pp. 150. 7s. 6d.

This admirable monograph records the results obtained by the writers in the treatment of gonococcal infection (with or without complications) by diathermy. The treatment is described in detail and the facts are

presented so moderately as to leave no doubt in the mind of the unbiased that diathermy in the hands of careful experts has a wide field of usefulness in the treatment of these conditions. The authors very wisely do not claim absolute cure as inevitable after a course of treatment by diathermy, but their cases quoted—with clinical notes before and after treatment—are in almost every case highly satisfactory.

An appendix describes five cases of arthritis where the cervix uteri seemed to be the focus of infection, but where gonococcal infection was not proved by pathological tests; these cases showed gratifying improvement after application of diathermy to the urethra and cervix, and should stimulate practitioners who have patients suffering from arthritis to have a pelvic examination made in every case where the primary focus of infection has not been satisfactorily discovered.

SURGERY OF THE EYE.

A Handbook for Students and Practitioners. Second edition. By ERVIN TÖRÖK, M.D., and GERALD H. GROUT, M.D., Surgeons to the Herman Knapp Memorial Eye Hospital, New York. London: Baillière, Tindall and Cox. 1925. With 510 illustrations. Pp. 484. 30s.

We have here a sound guide to the chief operations of ophthalmic surgery. This book opens with two chapters for which house surgeons should be especially grateful: the first on surroundings and general preparation for eye operations, the second on instruments and their management. The operations described in the second part of the book are those which in the hands of the majority of experienced ophthalmologists procure the best results. Under the heading Cataract, linear extraction with a keratome and flap extraction with a Graefe knife, with or without iridectomy, are described in a way which should be really helpful, the numerous figures assisting much; the intracapsular methods—e.g., Smith's and Barraquer's—are only briefly referred to. Under Glaucoma the three main operations—the classical iridectomy and sclerectomy according to the two methods of Lagrange and Elliot—are fully described; less important operations such as the cyclodialysis of Heine are also referred to and figured.

The multiplication of methods described for lid operations in text-books is apt to be confusing to the student, especially the various operations for entropion and ectropion and for ptosis. The procedures detailed in this book are well chosen, but may need supplementing for exceptional cases. The operation for extirpation of the lacrimal sac is so important that it might have been given a rather fuller exposition, especially with regard to the normal anatomy of the lacrimal canal, and we miss any reference to the alternative (intranasal) methods of dealing with dacryocystitis.

The large number of illustrations help to make the descriptions intelligible. On the whole, this is one of the best books on the subject that has reached us.

MODERN NURSING OF CONSUMPTION.

Second edition. By Dr. JANE WALKER. London: Scientific Press, Ltd. 1924. Pp. 75. 2s. 6d.

This little book on the nursing of consumption is full of useful obiter dicta, common sense, and wit. There can be no doubt that sanatorium nursing taxes the patience of a nurse to the utmost; outside the sanatorium there is nothing but bucolic monotony, and inside there is a routine seldom, if ever, enlivened by that whiff of chloroform and gleam of the surgeon's knife which provide the thrills making surgical nursing so curiously popular. Dr. Walker has done a great service in describing sanatorium nursing in such a way that, though she does not invest it with an impossible halo, she introduces a certain amount of much-needed colour into the picture.

MY MOORLAND PATIENTS.

By a Yorkshire Doctor. Edited by J. C. POWELL.
London: John Murray. 1924. Pp. 242. 7s. 6d.

WE are glad to see that this book, the first edition of which was reviewed in our columns, is now issued in a cheaper edition, especially as the cheapness, so far as we can see, has not been put into the paper, the printing, or the illustrations. As a record of a state of manners and customs which are rapidly passing, or indeed have entirely disappeared, the volume is most valuable, and makes excellent reading. The "Yorkshire Doctor" was Dr. R. W. S. Bishop, who died in 1921.

EPSOM COLLEGE: THE ANNUAL MEETING.

THE annual meeting of the governors of Epsom College was held at the offices, 49, Bedford-square, London, W.C., on June 27th, when Dr. Raymond Crawford presided. The secretary read the names of the successful candidates as follows:—

"Christie," "Pugh," and Ordinary Pensionerships.

	Votes.		Votes.
*Baynes, Donald	4755	+Goulston, Arthur	1428
†Ayres, Edith C.	2004	+Willis, Joseph D.	1399
†Chatterton, Percy	1468	‡Kennedy, Florence A.	1334
†Stephenson, Hilda	1440	‡Shaw, Annie C.	1124
* "Christie" Pensioner.		† Ordinary Pensioners.	
† "Pugh" Pensioners.			

Foundation Scholarships.

	Votes.		Votes.
McClintock, John H. T.	10764	Ryle, Ian N.	6319
Lewthwaite, Christopher	9809	Marsh, Thomas A.	6201
Emrys-Roberts, Hugh M.	9491	Sanderson, Paul B.	6026
Beck, Geoffrey A.	9025	Wolfenden, Henry C. L.	5666
Allen, Edward V. M.	8863	Farman, Henry C.	5695
Pinniger, John L.	8208	Kee, Eric M.	4821
Burgess, Christopher J. V.	6648		

Addressing the governors, the Chairman said that he hoped this would be a memorable year in the annals of the College and one pregnant of far-reaching results. Increased support from the profession and others had enabled the Council to face increased commitments in various directions. In their determination to attain the highest educational level, they had made substantial improvements in the pecuniary prospects of the masters. The year had seen the completion of the rebuilding of the chapel as a memorial to the masters and boys who fell in the war. The reconstructed chapel, a brick basilica of admirable internal proportions, now embodied worthily the spiritual aspirations of the College. A new chemical block, that had been thought and talked about for so many years, was now actually in hand, and had been made possible by several generous bequests that had come to hand. The vacated space would afford much-needed additional accommodation for class-rooms and lecture-room, and for an improved natural history museum. The Council were now in the position, by the munificence of a good benefactress, to carry out a complete transformation of the existing library, and to make it far more attractive and serviceable to the boys, and Dr. Crawford expressed the hope that similar help from some other quarter might be forthcoming towards the equipment of a museum, worthy of a school that supplies so many recruits to scientific professions; £500 would solve all difficulties in that direction. Another need of the College, that might well appeal to those of sporting instincts, was the levelling and extension of some parts of the playing fields, so that all the boys might play their games under more inspiring conditions. The Bursar had secured an estimate for the work, which showed that it could be well done for £1500. These things were beyond the capacity of the normal revenue of the

College, which this year was bearing the cost of an extensive substitution of electric light for gas, and which would almost at once have to provide better washing and drying facilities in the Lower School, and probably in the not distant future to undertake the centralisation of a scattered and wasteful system of heating and hot-water supply.

The Chairman concluded on a note of gratitude to all who had helped them; to their good subscribers, donors, and benefactors; to their organisation of local secretaries, which he wished to extend far more widely; to the great medical institutions, and the medical press. He also asked for special thanks to Mr. Gerald Stanley who had established at his own expense a scholarship giving free education at the College, and to Mr. Arthur Chudleigh, who had given to the chapel a silver-plated cross, six candlesticks, and vases for the altar, and an alms dish. He hoped that the generosity of all these might prove contagious in many quarters.

On the motion of the Chairman, the report of the income and expenditure account was adopted and the Council and officers for the year were elected or re-elected. On the motion of Dr. F. de Havilland Hall, seconded by Sir StClair Thomson, Dr. Crawford, who has worked so untiringly for the College and has collected over £1000 in subscriptions, was elected a Vice-President.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS: PROVINCIAL MEETING.

A PROVINCIAL meeting of this Section was held on June 27th at Manchester, Mr. H. E. G. BOYLE, President, in the chair. The members were most hospitably entertained by their northern fellows, and after luncheon in the University Refectory adjourned to the lecture room and physiological laboratories.—Dr. H. P. FAIRLIE read a paper on Chloroform Anæsthesia, in which he deprecated the view that chloroform should never be used. It was, in his view, often the best anæsthetic, but only in the hands of those who were thoroughly experienced in its use. The fatigue caused to the patient by prolonged ether inhalation could often be averted by judicious employment of chloroform.—Dr. J. BLOMFIELD pointed out the difference between the two kinds of chloroform fatality, one avoidable and the other not, and agreed that when proper selection of anæsthetics for all cases was practised chloroform would often be chosen and used by the expert.—Dr. S. R. WILSON described the causation of ventricular fibrillation, and pointed out the fallacy of preliminary atropine if chloroform fatalities were ascribed to vagus inhibition.—Dr. W. J. McCARDIE alluded to the advantages of mixture with varying proportions of chloroform.—Mr. G. RAMSEY PHILLIPS alluded to the arrangement for increasing concentration of chloroform into the Vernon Harcourt inhaler.—Dr. KIRKBY THOMAS described the safety inherent in the low position of the patient's head.—Dr. ANDREW WILSON described deaths which had occurred before the administration of the anæsthetic had commenced and agreed with the observations of Dr. Fairlie and Dr. Blomfield.—Dr. H. W. FEATHERSTONE described the difference in resuscitating those patients who collapsed under chloroform compared with similar cases under other anæsthetics.—In the laboratory Dr. S. R. WILSON and Dr. S. McSWINEY demonstrated the effects of intravenous injection of adrenalin into animals anæsthetised with ether and with chloroform, and a number of charts and of different kinds of apparatus was also demonstrated.

THE LANCET.

LONDON: SATURDAY, JULY 4, 1925.

MALARIA IN EUROPE.

IN 1924 the Permanent Health Committee of the League of Nations appointed a Malaria Commission composed of seven members, several experts, and a number of corresponding members to inquire into the incidence and epidemiology of malaria in Europe, and to investigate the problem of quinine administration. The results of these inquiries in Italy, Russia, and the Balkan States have recently been published,¹ and we are informed that further reports on other countries will be issued from time to time. The itinerary of the tour was a comprehensive one, and occupied a period of three months of continuous travel. Commencing in May, 1924, the Commission visited Dalmatia, Serbia, Greece, Bulgaria, Roumania, Russia (Ukraine, Don basin, Caucasus, Volga region, and Moscow), and Italy, eventually dispersing at Rome on August 28th. A large amount of data of a general nature has been accumulated, though no facts of a novel or striking nature have emerged. The greater part of the information was obtained from the health departments of the countries visited.

Special interest centres on the spread of malaria in Russia which has taken place since the war. The most malarial part of this country is undoubtedly the Middle Volga district. Before the war 400 cases of malaria for every 10,000 inhabitants were registered there yearly, and in 1923 in the German Republic of the Volga the disease became epidemic, so that approximately half the inhabitants were infected. This extraordinary spread of malaria in the Volga district, as indeed in the whole of Russia, was largely a result of the European War, aided by civil war in Russia with all its consequences. The population was forced through fear of starvation to emigrate to Turkestan, Bokhara, and the Caucasus, whence the severe forms (subtertian parasite) were imported. In the Volga district the geographical features of the river are held to be mainly responsible for the spread of the disease. It appears that the meadows on each side of the river are inundated in spring time, and on subsidence of the floods permanent pools remain which constitute the breeding grounds of mosquitoes. In this district there are, as a rule, two rises of malaria incidence during the year; the spring increase commences in March, when the anophelines are not found; the autumn epidemic, commencing about August, is undoubtedly spread by the swarms of newly-hatched mosquitoes which then abound. The spring epidemic consists, as has been noted in Salonica, Palestine, and elsewhere, almost entirely of benign tertian malaria, probably relapses of a previous infection; in August and September the subtertian parasite predominates, and has accounted for 85 per cent. of the cases. The quartan form appears to occur only at the cold season of the year. As regards Russia in general, the information indicates that the accounts of the effects of malaria, as described in some English journals, are greatly exaggerated.

In that country epidemic malaria reached its maximum in 1923, when the deaths due to the disease were estimated at 60,000 (0.4 per mille of population), a figure hardly comparable with the average death-rate in badly infected districts in British India, where the disease usually causes a death-rate at least ten times that figure. The occurrence of epidemic malaria in Europe is by no means a new event. The most important factors concerned in the recent epidemic appear to have been: (1) The importation of new cases and carriers into areas where malaria was already endemic; (2) the importation and aggregation of susceptible people, particularly in connexion with the settlement of refugees and colonists in the endemic areas; (3) various social and economic circumstances, especially, in some countries, a great lack of quinine. Undoubtedly, if the countries concerned had a properly organised medical or sanitary service much could be done to eliminate nearly all these factors. As regards the endemicity of malaria in Europe, the important rôle of "house infection" in the spread and maintenance of the disease impressed itself greatly on the Commission. It is essentially a family or household affair, to be explained by the close and continuous association existing in most dwellings between the human source of infection, the insect carrier, and the human recipient to which the domestic habits of *Anopheles maculipennis* especially lend themselves.

The large amount of data collected by a commission of such a comprehensive nature makes it difficult to crystallise the main trend of the work, but the general impression may best be gathered from the wholly admirable summary by Colonel S. P. JAMES, the British representative. He points out that, with the exception of Italy, the vital statistics with reference to malaria are inadequate and are therefore not comparable with the methods usually employed in malarious tropical countries. In the absence of these necessary statistics the information as to the past and present incidence of malaria in the countries visited is vague and imperfect, but it is known that from time to time, at irregular intervals, all these countries have experienced, in addition to this endemic malaria, striking invasions of the disease in epidemic form, which has spread to localities previously free. Very little information could be obtained as to the effects of the recent epidemic wave. In Dalmatia, it is true, and in Serbian Macedonia numbers of patients were seen suffering from greatly enlarged spleen, the result, probably, of the epidemic disease, but elsewhere the epidemic had abated almost completely and the distribution of malaria has once more become restricted to its original endemic centres. Little information was likewise obtainable about the mortality which the epidemic may have caused in different countries and still less about the severity of the cases. To those with experience of malaria in tropical countries the absence of evidence of a high fatality was very surprising. The impression obtained, however, was that there is no area in Europe in which the fatality of the recent wave of malaria is even remotely comparable with the fatality of the disease as seen in the Punjab during the epidemic of 1908, when the deaths were 13 times more numerous than the normal. In Greek Macedonia the epidemic of 1923 is said to have caused 700 deaths amongst 10,000 refugees, but none of the figures given, either here or in Roumania or Bulgaria, is anything but approximately correct. In suggesting antimalarial measures due consideration has to be paid to the incompleteness of the sanitary services which has resulted from the war, and to the fact

¹ League of Nations Health Organisation: Malaria Commission. Report on Its Tour of Investigation in Certain European Countries in 1924. CH. 273. Geneva, March 25th, 1925. Published in Great Britain by Constable and Co., Ltd. 6s. 9d.

that in Europe malaria is one of the least, in contrast to the tropics, where it constitutes the most dangerous endemic disease. The Commission therefore deprecates the undertaking of costly antimalarial measures in circumstances where such action is of doubtful value and when the money would be better employed in other essential health services. Every effort should therefore be made to combat endemic malaria in Europe in the *houses* of the people themselves rather than in the environment. The competent sanitary authority should enter the houses of the people, treat those infected, and educate them to kill off the few sluggish "domesticated" anophelines whose wants are all supplied in that particular house and who constitute the chief sources of infection. In this simple way more good will be done than by the most extensive measures against larvæ and adult insects in the environment. Unfortunately, this decision involves the onus of overcoming the well-recognised difficulty that medical officers and sanitarians who have become interested in the elimination of breeding places and in engineering problems of drainage are usually loth to discard those measures. The outstanding fact is once more emphasised that it is by a well-equipped medical and public health service that malaria in Europe will be eventually eradicated. That this has been the case in England is set out forcefully by Colonel A. W. ALCOCK on another page. By applying this lesson to European countries in general the League of Nations Commission has rendered a valuable and permanent service.

PAY HOSPITALS FOR PATIENTS OF MODERATE MEANS.

SUNDAY last, June 28th, was "Hospital Sunday"; the financial results of the day have not yet been published, but it is to be hoped that a substantial sum will be returned to the coffers of the Metropolitan Hospital Sunday Fund. The hospitals are struggling against grave financial difficulties and their future is problematical unless they can be established on some sounder basis than the present one. Among other schemes proposed is the extension of their wards to paying patients. The question of institutional accommodation for the middle-class patient has become acute during recent years. Many schemes have been put forward on paper and several have been tried in practice, with a varying measure of success. The Conference of the British Hospitals Association, held in Manchester on June 25th, debated the subject once more. Sir WILLIAM MILLIGAN pointed out that the poor are admirably looked after and cared for, while the rich are quite competent to look after their own interests; but an increasingly large number of those of moderate means find it more and more difficult, owing to the expense entailed, to secure those benefits from recent advances in medicine and surgery to which they are entitled. Consequently, and more especially within recent years, large numbers of the middle classes are forced, often against their inclinations and wishes, to seek treatment in existing voluntary hospitals, with the result that waiting lists attain quite inordinate dimensions and serious economic loss to the community results from delay in admission and the prolonged abstention from work of the wage-earner. Moreover, the public have recognised that modern medicine and surgery have become more complex and more detailed, and that the numerous adventitious aids to exact diagnosis are found to exist to more advantage within the walls of some great institution rather than in the chambers of any

individual physician or surgeon, however well equipped his consulting rooms may be. The tendency, therefore, to resort to institutional treatment is not unnatural, is becoming more accentuated every year, and is a tendency which is likely to go on growing, considering the undeniable advantages which it presents. The provision of a limited number of wards or beds for paying patients is already an accomplished fact in certain hospitals, and has been the means of meeting, to some slight extent, the existing demand for institutional treatment at moderate fees. At the moment it is at any rate a quite inadequate provision for existing requirements, does not always afford that privacy, which is its main objective, and proves a complicated arrangement so far as hospital accounts and hospital administration are concerned.

Sir WILLIAM MILLIGAN's proposal is that a "pay hospital" should be established in connexion with each large general hospital. Certain services, such as lighting, heating, laundering, catering, and nursing could be arranged in common for the two institutions, thus lightening the financial burden and widening the experience of the nursing staff. The fundamental regulations suggested by Sir WILLIAM MILLIGAN were:

1. That the Committee of Management should consist of three members elected by the parent hospital, three by the preference shareholders, and three prominent citizens, and should meet monthly.
2. That a resident medical officer should take charge of the patients under the direction of the specialist.
3. That no patient be admitted without a written recommendation from a duly registered medical practitioner.
4. That the income limit for admission should be £600 and the charge be 6 guineas per week; fees for special nurse, anæsthetic, X ray, or pathological report being extras.
5. That the patient be free to employ any member of the staff of any hospital, arranging the fees with him personally.
6. That the practitioner on whose recommendation the patient is admitted have free access to see his patient at any time but that he have no responsibility in the matter of treatment.
7. That if a case does not necessitate the advice of a consultant the onus of treatment shall rest with the resident medical officer after consultation with the patient's general practitioner, and that the former may perform an operation if the patient be unable to afford the fee of the consultant.
8. No case of phthisis or infectious disease shall be admitted.

Sir WILLIAM MILLIGAN put forward a specimen budget to show that the institution would be a sound financial proposition, and suggested that the financing of such a "pay hospital" might be approached in one of three ways:—

1. By borrowing the whole of the money at 5 per cent. on the security of the building and of the parent institution, and creating a sinking fund of 1 per cent., which would redeem it in 36½ years.
2. One-half of the money required might be borrowed at 5 per cent. on the value of the building, and the other half by the issue of 6 per cent. cumulative preference shares and ordinary shares; or
3. The formation of a limited liability company with a capital of £50,000, divided into 30,000 £1 6 per cent. cumulative preference shares and 20,000 £1 ordinary shares, the whole of the ordinary shares to be held by the parent hospital.

As the subsequent discussion emphasised, the success of such a scheme depends entirely on the active coöperation of the medical profession. Whether this would be obtained seems to depend mainly on the wording of Clauses 2 and 6. The general practitioner is to be "allowed access" to his patients while in hospital, presumably as a friend, for the satisfaction of his scientific or personal interest in the case. It is doubtful whether there is anywhere in the world a more disinterested body of men than the general practitioners, but no amount of scientific enthusiasm or devoted service will support and educate a growing family. It is on these middle-class patients that the practitioner is dependent for his

living; he can scarcely be expected to encourage a scheme that will take these patients off his visiting list as soon as he has diagnosed any serious malady. Nor can the patient be expected to desire the continued attendance of the practitioner when he finds himself under the care of a resident medical officer, whose competency is vouched for by his position in a great organisation. The "family doctor" is the backbone of the medical profession, and though he may have many failings in the eyes of the specialist and the research worker, it is by his improvement and not by his abolition that the public health will best be served. Some such scheme as that suggested by Sir WILLIAM MILLIGAN is undoubtedly called for, but it will have a greater hope of successful life if the general practitioner be left in charge of his patient as he would be in a nursing home, with the enormous advantage to everyone of coöperation with the hospital staff. The sisters in charge of nursing homes find no insuperable difficulty in the absence of a resident medical officer and the attendance of a number of general practitioners; there is no reason why the same working should not apply to the "pay hospital." The harassed practitioner fervently desires to see the establishment of some institutional treatment that shall be within the means of his poorer paying patients, but he very rightly and properly desires that any such scheme shall leave him in responsible charge of the conduct of the case.

WELFARE OF THE BLIND.

THE fifth annual report of the Advisory Committee on the Welfare of the Blind indicates that further progress has been made towards the solution of the problem of making life tolerable for this unfortunate class of the community. Since the qualifying age for the receipt of the old age pension was lowered for blind people from 70 to 50, 85 per cent. of those so qualified are in receipt of the pension, the remaining 15 per cent. being presumably in possession of some private means. Schemes for promoting the welfare of blind persons have now been presented by the 145 local authorities concerned. All have been accepted and the great majority are in full operation. Of the total number of blind in England and Wales—36,518—more than 32,000 are over 16 years of age, and of these about one-quarter are actually employed either in workshops for the blind or as "home workers," the definition of which term appears to be somewhat elastic. The present report records some progress in the efforts made to obtain employment for blind persons in ordinary industrial concerns and in work normally performed by sighted persons. So far as the more skilled processes go this has not been found to be practicable, but a number of firms in the Midlands have expressed their willingness to give blind persons a trial period of employment on such operations as the preparing and labelling of tins, stringing tennis rackets, taping, smearing and packing of golf balls, armature winding, cardboard box making, gauging lamp glasses, assembling and packing cycle bells, and the sorting of hemp. As it is never expected that the average blind man can earn a living wage, the report recommends that voluntary agencies should receive official grants of not more than £20 per annum per head in respect of blind persons employed in ordinary factories and workshops.

There remain nearly 60 per cent. of the blind in the country who are classified as unemployable, some of them mental or physical defectives or afflicted with deafness, the majority of them having become blind in adult life, after which the difficulties of training for suitable employment are, of course, indefinitely increased. A great advance in the provision of assistance for unemployables has been

made through the institution of the home-teaching service. At the present time there are 111 sighted and 159 blind or partially blind home-teachers employed by the various agencies and local authorities in the country in this capacity. Besides giving instruction in the reading of embossed literature and in simple pastime industries, they are expected to be friend and adviser to their pupils in domestic and social matters, and all those who are newly appointed are required to obtain the home-teachers' certificate of the College of Teachers of the Blind within two years. To well-educated young women with a natural ability for social welfare work the report commends this service as providing a useful field of work with fair remuneration, in which their efforts would be abundantly repaid by the results achieved. The report shows that consequent upon the passing of the Blind Persons Act of 1920 there has been a very substantial improvement in the general circumstances of the blind in the country. The triple partnership of the voluntary agencies, local authorities, and the State in dealing with the welfare of the blind has been more than justified. One matter is touched on in the report which needs to be emphasised. At present, owing to the lack of suitable schools for the partially blind, a good many of these children, more especially the high myopes, are being educated in blind schools, whereas it would be far more to their advantage, and ultimately an economy to the State, if schools or classes of the type initiated by the London County Council were made more generally available. The after-care of this class falls more properly within the sphere of the juvenile employment committees of local education authorities. The Board of Education are rightly proposing to press for the provision of further special accommodation for this class of children.

THE RADIOLOGY CONGRESS.

THE International Congress of Radiology which is being held in London this week opened very pleasantly on Tuesday evening, June 30th, with a reception to the delegates and their friends, given by Dr. C. THURSTAN HOLLAND, the President, at the House of the Royal Society of Medicine, 1, Wimpole-street. A large number of guests was present, forming a truly international gathering. In the library an interesting display of old books dealing with medical electricity was on view, and in the Barnes Hall Dr. MURRAY LEVICK entertained the company with a description of penguin life in the Antarctic, illustrated with lime-light views taken by himself. This was followed by a cinematographic film of certain tuberculous conditions, demonstrated by Dr. LEWIS GREGORY COLE, of New York. The subsequent meetings of the Congress are being held in the Central Hall, Westminster, commencing with a discussion on international units and standards for X ray work, and concluding on Saturday, July 4th, with a meeting of the international delegates to consider the formation of an international committee. The work of the Congress is divided into three sections, radiology, physics, and actino-therapy respectively, and with regard to the latter branch we would draw attention to the paper on a Light Department in a Hospital for Surgical Tuberculosis, by Sir HENRY GAUVAIN, in our present issue. This Congress has been promoted and organised jointly by three societies in Great Britain, all interested in similar objects, the Röntgen Society, the Electro-therapeutics Section of the Royal Society of Medicine, and the British Institute of Radiology, and it is a source of gratification to British radiologists that they have had promises of world-wide support. The Congress itself will determine whether this meeting will form the first of a regular periodic series of such meetings, but however that may be, we feel assured that the laborious work carried out by Dr. HOLLAND, Dr. STANLEY MELVILLE (General Secretary), and the organising committee will prove a source of pleasure, interest, and profit to all whose interest lies in developing radiology—the infant prodigy of medicine.

Annotations.

"Ne quid nimis."

ROYAL COLLEGE OF PHYSICIANS OF LONDON: CENTENARY CELEBRATION OF THE PRESENT COLLEGE.

A CONVERSAZIONE was held at the House of the Royal College of Physicians on the evening of June 25th, to celebrate the centenary of the occupation of the present building of the College. The guests were received by the President, Sir Humphry Rolleston, and Lady Rolleston. A large number of Fellows, Members, and ladies attended. The College buildings are admirably adapted for a reception of this kind and the valuable possessions of the College were shown to great advantage. The library, where the President received the Fellows and guests, is a large and attractive room. The new lighting shows its contents to advantage, including the beautiful mace, which is one of the chief of the College treasures.

An interesting historical note was attached to the programme given to each guest on arrival. From this we learn that the Royal College of Physicians was founded by Thomas Linacre, the famous scholar, who obtained from King Henry VIII. a Royal Charter, dated Sept. 23rd, 1518, granting certain powers to the College for the purpose of controlling those who practised medicine in the City of London and seven miles around. The powers of the College were extended by later charters so that authority was exercised over all those who practised medicine in England, with the exception of doctors of medicine of Oxford and Cambridge Universities. Thomas Linacre was elected the first President, and five other physicians were named as Fellows of the College with power to add to their number. The first meetings of the College, for the transaction of business, were held in Linacre's house in Knight-riders-street, in the City, and here the College remained until 1614, when a new house was provided at Amen Corner, on the site of the present House of the Canons Residentiary of St. Paul's. This College House was burned down in the Great Fire of 1666, and in 1674 the College removed to a new building in Warwick-lane, in the City, which had been built from the designs of Sir Christopher Wren. Here it remained until 1825, when it removed to the present building. The library contains about 40,000 volumes, of which more than 4000 were printed before the year 1600. The collection is not confined to medical works alone, for it contains sections comprising early editions of the classics, theology, law, and the sciences. The College possesses 112 portraits in oil of distinguished Fellows, and the collection is representative of many of the portrait painters in England during the last three centuries. These are placed in the large library, the Censors' room, the reading room, and on the staircase. The handsome panelling to be seen in the Censors' room dates from the year 1674, and was removed from the College in Warwick-lane, where it was placed through the munificence of Dr. Baldwin Hamley. The portraits of past Presidents and Fellows form a most striking and interesting collection. They are shown to great advantage in the library, Censors' room, reading room, and hall of the College. Among these, those painted by Gainsborough, Reynolds, and Romney are specially worthy of notice. There is also a portrait by Van Dyke and a painting by Zoffany.

Among the entertainments there was a fine exhibition of cinematograph films illustrating nature-study. It was pleasant to hear that these were of British origin. An interesting programme of music was given by the Vale Lane Sextette. The engraved portraits of Fellows of the College on view in the small library and book-store were well chosen and attracted a good deal of attention.

The conversazione was a most successful one. This notable historic incident in the history of the College was, by common consent, very suitably commemorated, and those present spent an interesting and instructive evening. The President and those responsible for the arrangements are greatly to be congratulated on the success of a very interesting commemorative function.

THE USE OF ARSENIC IN PUERPERAL FEVER.

THE use of arsenical salts in puerperal infection was the subject of a paper by Marbais at the Congress of Strasbourg in 1923. Dr. H. Lapervanche has now published a record of 28 cases treated in this way at the obstetric clinic in Bordeaux. The salts employed were sulpharsenol (Pluchon) and novarsenobenzol (Billon), which were shown to have a strong bactericidal action on streptococci in vitro and in rabbits. They can be used prophylactically in cases where the labour has been prolonged and infection is suspected. The only contra-indications are the presence of serious hepatic trouble and uræmia, cancer, and what the author calls "bacillaires," presumably the subjects of chronic bacterial infections. It is usual to allow a day to elapse between the first and second injections, and then to give injections on two successive days with an interval of one day between. The urine should be watched for albumin. Intravenous or subcutaneous injections of 0.1 gr. of N.A.B. or 0.06 gr. of sulpharsenol is the initial dose, and subsequent injections should not rise higher than 0.15 gr. of N.A.B. and 0.12 gr. of sulpharsenol. No evil results were noted beyond the local discomfort of the injection, and the results were most gratifying, the fever being controlled by the drug. These cases were streptococcal, and syphilis was excluded by the Wassermann reaction. The method seems worthy of a more extended trial.

JAMES MEASE.

In the number of *Annals of Medical History*, published in March, 1925, being No. 1 of Vol. VII., Dr. William Snow Miller, of Wisconsin, reprints a paper read before the Medical History Seminar of the University of Wisconsin in November, 1923. The subject of the paper is Dr. James Mease, who is interesting as being the author of the first contribution of note upon hydrophobia published in America. From another point of view he is of interest to ourselves as having fallen foul of William Cobbett (an easy thing to do), and Cobbett, as readers may know, was a good friend to THE LANCET in early days. Mease graduated in medicine in 1792, being one of the first seven graduates from the medical department of the University of Pennsylvania. This University had arisen after sundry vicissitudes out of the College of Philadelphia, which, in its turn, was begotten by a pamphlet written by Benjamin Franklin in 1749. Mease's paper upon hydrophobia was first published in the *American Museum* in 1790, and this paper was subsequently elaborated into his thesis for the doctorate. Dr. Miller gives many quotations from the thesis which show that Mease was in advance of his time in his views on the disease. He maintains that disease only arises from a "poison of a peculiar nature in the saliva of a rabid animal, belonging to the genus *canis*." He also is of opinion that the poison, to manifest its effects, must find entrance to the body through a wound. As to treatment he recommended excision of the bitten place, if possible, together with the cautery before any symptoms had appeared. After they appeared he considered any treatment useless. The year after his graduation—namely, in 1793—there was a serious epidemic of yellow fever in Philadelphia during which Mease was attacked and was treated by Rush, being bled to the extent of 75 oz. in five days. He recovered and was appointed port medical officer of Philadelphia. Benjamin Rush, the professor of

clinical medicine in the University, treated the fever by free purgation and copious bleeding, methods which were warmly supported by Mease, although other medical men disapproved of them. These dissenters found a mouthpiece in Cobbett, who published a bitter attack upon Rush in *Peter Porcupine's Gazette*, which led to an action for libel in which Cobbett was cast in 5000 dollars damages. Mease gave evidence in favour of Rush and this led to an attack on him by Cobbett in the opening number of his other paper the *Rush Light*. Like most people in authority Mease also got into trouble with certain persons owing to his allowing vessels to proceed from Philadelphia to Burlington without performing quarantine, and Dr. Miller gives a full account of the quarrels. Mease was not only a physician, but an active member of Philadelphia society, giving generous support to that city's many intellectual and humanitarian institutions. He married in 1800 Sarah Butler, by whom he had two daughters and three sons. The sons, on attaining the age of 16, changed their name to Butler under their grandfather's will and one of them, Pierce, married Fanny Kemble. Mease died in Philadelphia in 1846.

FRAMBOESIAL OSTEITIS.

THE remarkable condition called "goundou" or "henpuye," and characterised by bony outgrowths on the sides of the nose, has been recognised as prevalent in parts of tropical Africa since MacAlister in 1882 noted the existence of "horned men in Africa." In 1900 Chalmers described the disease on the Gold Coast in THE LANCET¹ under the name of henpuye, and reported five cases, though he doubtless saw many others and operated on several; he was the first to attribute its causation to frambœsia or yaws. Major Botreau-Roussel, of the French Colonial Army Medical Service, has now published² a most complete work on this curious affection. After four years' residence on the Ivory Coast, during which time he only saw one case, chance brought him two patients, on whom he operated with success; as a result more and more patients came for treatment, until he had seen 130 cases and operated on 113. The outgrowths on the nose limit the field of vision and, in the more extreme cases, to such an extent as seriously to handicap the sufferer in the struggle for existence, which is a severe one in these regions; and the author believes that many of these unfortunates are quietly destroyed by their relatives, who cannot afford to feed a useless member of society. It is not surprising, therefore, that the natives should come from long distances to be relieved of their disability by operation.

From his unequalled experience of the disease, Major Botreau-Roussel has formed an opinion on the following points. The lesions of the face are the most striking but not the most frequent symptom of an osteitis which may attack the greater part of the skeleton, the long bones, and especially the tibia, being the most commonly affected. The osteitis is definitely caused by frambœsia, and usually begins either during or shortly after the frambœsial eruption. Patients suffering from the osteitis are refractory to inoculation with frambœsia; in the one case in which the onset of the osteitis was observed, at the sixth month of the frambœsial eruption, both the bony and cutaneous lesions yielded to treatment by novarsenobenzol. The author makes some interesting observations on the geographical distribution of the disease; commonest on the Gold and Ivory Coasts, it occurs throughout tropical Africa, and has been found in the West Indies, Central and South America, China, Sumatra, Malay, and New Guinea. No case has been reported from Europe, but the author believes that some cases labelled leontiasis ossea would have been called "goundou" had they occurred in the tropics; he concludes that true leontiasis is due to

hereditary syphilis, and that the *Treponema pallidum* and the *Treponema pertenue*, the causative organism of yaws, are able to produce very similar lesions.

Major Botreau-Roussel's work is profusely illustrated and forms a notable contribution to the study of an important tropical disease.

INTERNATIONALISM AND MEDICINE.

WE have received from Dr. A. A. Warden, of Paris, an interesting communication under this title, in which he points to the recent visit to Europe of our American colleagues as a proof of the spread of the feeling that medicine is an international affair. The view has been expressed so often and so fully in these columns that we need not reproduce Dr. Warden's words, while we agree with him that medicine in its national and international relations occupies no different place to that occupied by science, literature, and art. All developments of these immediately add to the common stock of wisdom of the world in a degree proportionate to the dissemination of new work. But Dr. Warden singles out medicine as the great activity which might promote the cause of international peace if (and it is a large "if") all those who practise it should refuse to have anything to do with the conduct of a war. There is both truth and ingenuity in his argument that the services of medicine, while they alleviate the horrors of war, may also prolong those horrors by maintaining a continuous supply of fighting men and, through the prevention of epidemics, a continuous supply also of those who minister to the forces. This position has been pointed out before, but we doubt if it would act as a common inducement to medical men all over the world not to place their services at the disposal of their countries. Dr. Warden suggests that this is a question which might well be submitted to an international gathering of medical men, and brings the idea forward in order to ascertain how far it receives support in this country.

INOCULATION AGAINST CATTLE DISEASE IN SOUTH AFRICA.

Mr. L. E. W. Bevan, M.R.C.V.S., has been doing good work in Southern Rhodesia, and in reports¹ to the Secretary to the Minister of Agriculture and Lands, Salisbury, he gives an account of his findings. He has devised a special vaccine for use against infectious abortion of cattle which he names "devitalised vaccine." His aim has been to retain in the vaccine only those elements required to call out in the treated animal the maximum quantity of specific antibodies. The particular virtue claimed for the vaccine is that it can be applied without risk during pregnancy, so that the resistance to infection is maintained until the danger of infection has gone by. Reports received from cattle owners who have used the vaccine are encouraging, and from hundreds of careful experiments and observations at the laboratory the efficacy of the vaccine has been verified. Mr. Bevan thinks that the best plan of campaign in dealing with an outbreak of infectious abortion is to seek out and eliminate the source of infection, to disinfect cow-sheds, kraals, and infected watering-places, to get rid of non-breeding cows and those constantly returning to the bull, to test all bulls and remove reactors, and to vaccinate all cows in danger of becoming infected. He regards it as essential to continue this policy over a series of years. Infectious abortion of cattle merits drastic treatment, both on its own account and because of its apparent infectivity to man. Out of 30 cases of Malta fever admitted to Rhodesian hospitals at least one-half came from areas where goat's milk had not been consumed but where infectious abortion existed at the time among the cattle. Mr. Bevan holds that the Rhodesian strain of *B. abortus* may be closely related to *M. melitensis*. In dealing with trypanosomiasis in cattle

¹ THE LANCET, 1900, i., 20.

² Framboesial Osteitis, or "Goundou." By Major Botreau-Roussel. Paris: Masson et Cie. 1925. Pp. 129.

¹ Southern Rhodesia: Report of the Director of Veterinary Research, 1924. Inoculation of Cattle Against Red-water and Gail Sickness, Bulletin No. 536.

he has experimented with a preparation containing antimony and arsenic injected subcutaneously, a procedure which has in many cases enabled the owners of fly-struck cattle to carry on farming operations which they feared would have to be abandoned. Successful inoculation has also been practised against red-water and gall-sickness which are responsible for enormous losses among cattle. Protection of imported stock from infection by ticks until the immunity resulting from inoculation has time to develop is an important measure. Mr. Bevan has had the opportunity of dealing with disease on a far larger scale than veterinarians have in these isles, and has made good use of his opportunities.

NEW DRUGS FROM SOUTH AMERICA.

THE recent Mulford Biological Exploration of the Amazon basin, under the direction of Dr. H. H. Rusby, resulted in bringing back to the United States much interesting material, and amongst this were at least two drugs which, it is predicted, may have some therapeutic application. Caapi, the first of these, is the root and rhizome of a woody vine, *Banisteria caapi*, which grows in the central portion of the Amazon basin. The plant belongs to the *Malpigiaceae*, a large family of tropical woody climbers, but no other member of this family is known to possess similar medicinal properties. The use of this drug by the natives in Colombia was first described by Humboldt and Spruce, and, later, two German explorers, Weiss and Schmidt, made extensive observations on its use and obtained photographs of natives under its influence, but their researches were apparently never published. Dr. Rusby heard of the plant from these workers, and with the aid of his photographer, Mr. Gordon MacCreagh, obtained material for study. In another part of South America Dr. O. E. White discovered the drug in use under the name of "ayahasco." In Bolivia it appears that caapi is used mainly as a stimulating beverage, similar to tea and coffee; but in Colombia the drug is used for the specific purpose of giving courage and fortitude in facing danger and enduring suffering. Dr. Rusby has given an account of the effect of this drug, from which the following passage is taken¹ :—

"Within a very short time after drinking the decoction, there is a powerful effect on the nervous system and on the circulation. The cutaneous circulation is checked, as manifested by a strong pallor. The subject is restless, and occupies a standing position. There is an intensely anxious or fixed expression to the countenance, and there are convulsive tremors. This condition lasts but a few minutes and is followed by a violent reaction, in which the blood rushes to the surface and the man becomes highly or even violently active. Fear, and even prudence, is entirely destroyed and he becomes extremely active muscularly. He is ready to fight anything and everybody, or any number of enemies and suffering is disregarded. He rushes about and seeks an enemy with utmost eagerness. This condition lasts for hours, and is followed by more or less exhaustion and somnolence. The nature of this somnolence is in doubt. Some accounts indicate it is a narcotic effect and that there are unnatural dreams and visions. Others indicate that it is the natural reaction following weariness or exhaustion."

A chemical examination of caapi has shown that it contains three, and possibly four, alkaloids, one of which is closely related to morphine. Three alkaloids have been separated with great difficulty—a phenolic alkaloid, a non-phenolic alkaloid forming a hydrochloride which is only soluble with difficulty, and the third, a non-phenolic alkaloid forming a more readily soluble hydrochloride.

The other drug which appears to be of pharmacological interest is extracted by the Indians of Central Bolivia by boiling portions of a plant known as miré (pronounced mee-ray). The plant is said to be a member of the nightshade family, and is employed by the natives as a muscular paralyrant and remedy for cutaneous parasites. In full doses the natives report that it produces paralysis of all the voluntary

muscles without any disturbance of sensation or intellect, while a profuse perspiration of the cold type is produced, and this perspiration is said to be capable of destroying all cutaneous parasites. Animal experiments carried out by Dr. T. S. Githens² indicate that miré causes paralysis of the voluntary muscles by an action on the spinal cord, a stimulation of the peripheral motor apparatus, resulting in twitching of the muscles, a stimulation of the salivary and sweat mechanisms and sometimes of peristalsis, while the heart is slowed, probably from vagal stimulation.

BRITISH MEDICAL ASSOCIATION: COMING EVENTS.

DURING the present month two important events in the life of the Association will take place. The first is the opening, on Monday, July 13th, of the Association's new premises, designed by Sir Edwin Lutyens, R.A., in Tavistock-square, London. The ceremony will be performed by H.M. the King, who will be accompanied by H.M. the Queen, and the Archbishop of Canterbury will dedicate and open the Memorial Gates erected by the Association as a tribute to the 574 members who fell in the Great War. The Reception Committee has not found it possible to get into touch with the relatives of all these deceased members and would, we understand, welcome application for tickets from any who have not been reached. The gathering will include delegates of medical bodies not only from Great Britain but from the dominions, colonies, and from foreign countries. The second event is the ninety-third annual meeting of the Association, to be held in Bath from Tuesday, July 21st, to Friday, the 24th, under the presidency of Dr. Frederick George Thomson, physician to the Royal United Hospital. The presidential address will be given on Tuesday evening, and the annual exhibition of surgical appliances, foods, drugs, and books will be officially opened on the same day. The various scientific sections meet during the forenoons of Wednesday, Thursday, and Friday, July 22nd-24th. The annual dinner will take place on Thursday, July 23rd; and the popular lecture will be delivered by Sir W. H. Bragg, F.R.S., on Friday, July 24th, at 8 P.M. The annual Representative Meeting will begin on Friday, July 17th, and be continued on the three following week-days. The statutory annual general meeting will be held on July 21st, at 2 P.M., and the conference of secretaries on Wednesday, July 22nd, on the evening of which day the secretaries' dinner will take place. Saturday, July 25th, will be given up to excursions to places of interest in the neighbourhood. The honorary local general secretary for the annual meeting is Mr. W. G. Mumford, F.R.C.S., to be addressed at the B.M.A. Committee Rooms, Bath, where he will be assisted by Dr. R. G. Gordon.

THE ROYAL MEDICAL BENEVOLENT FUND GUILD.

THE scanty support given to the Royal Medical Benevolent Fund is a grave blot on the escutcheon of the medical profession. In order to assist this most deserving charity a number of ladies formed themselves in 1909 into a Guild for the purpose of soliciting additional subscriptions and assisting the work of the fund by personal service. The fifteenth annual report of the Guild records a successful year of work. So rapidly are the activities growing that it has been found necessary to rent a permanent office at 58, Great Marlborough-street. The established branches are in a satisfactory condition and money has been raised by dances, bridge parties, American teas, bazaars, and other special efforts. There are, however, many provincial towns where no branch has yet been formed and it is most desirable that the work should be extended to every part of the country. One of the most engaging activities of the Guild is the "Father Christmas branch," which sends Christmas gifts

¹ Jour. Amer. Pharm. Assoc., February, 1924, p. 98.

² Loc. cit., p. 102.

to the sad cases on its books, sweets and books for the children, and money for the elderly. It is at the festive season that the burden of a hard life becomes more bitter, and a small remembrance such as the Guild is able to provide brings a feeling of joy quite disproportionate to the value of the gift. The heavy rentals demanded for single rooms as well as the general increase in cost of living and crowding of the labour market has reduced many of these people to real starvation; their appeals are almost always for work, but modern conditions afford little hope of livelihood to the untrained or partially-trained and elderly worker. The Guild allows money grants to the aged, the sick, and for special emergencies, such as removal, purchase of surgical appliances, spectacles or dentures, holidays, and the acquisition of some means of livelihood such as a typewriter. The fundamental principle underlying the work is to help people to help themselves. Scarcely more pathetic, but still graver from the point of view of the community, are the young children whose education cannot be completed owing to the death of their father. Much valuable service would be lost to the State if the Guild were not able to save these children from the lives of uncongenial and unproductive labour into which poverty would force them. The attention of practitioners and their wives is drawn to the value of the work being done by this Guild. The Secretary is Miss Thomson, 60, South Molton-street, W. 1.

THE SECRETARYSHIP OF THE ROYAL SOCIETY OF MEDICINE.

At its last meeting the Council of the Royal Society of Medicine selected a successor to Sir John MacAlister from a large number of applicants, the choice falling upon Mr. Geoffrey R. Edwards, B.A. Camb. Mr. Edwards was educated at St. Paul's School and St. John's College, Cambridge. He studied in Germany in order to qualify for the Woods and Forests Department of the Indian Civil Service, and continued this work in India. On his return to this country he joined the Royal Air Force as a pilot, was wounded, and had to alight in enemy country, entailing an imprisonment of 14 months in Germany. Subsequently, Mr. Edwards served on the Repatriation Commission in Germany and on the Inter-Allied Aeronautical Commission of Control. When finally demobilised he obtained the appointment of assistant secretary to the National Physical Laboratory, Teddington, where he had considerable experience in library and editorial work, in organisation, and in receiving. Mr. Edwards has travelled in most European countries and speaks French and German. He takes up the duties for which he is so well qualified on Sept. 1st next, and we wish him well in a position of great importance and interest. We are glad to learn that the Society has decided to mark Sir John MacAlister's retirement by appealing for funds to raise a memorial to his great work for medicine over a period of 38 years. Fellows of the Society will be glad to have the opportunity of constituting a permanent memorial of the man to whom the very existence of the Society is chiefly due. The proposal is to ask Sir John MacAlister to sit for his portrait, to be rendered in oil or stone.

THE JOHNSTON-LAVIS GEOPHYSICAL BEQUEST.

THE late Dr. H. J. Johnston-Lavis, who was both a medical man and a distinguished geologist, bequeathed to University College, London, his geophysical collection of some 20,000 specimens and a remarkable library of books and pictures relating to volcanic phenomena. These have been housed at 134, Gower-street, a few doors from University College, where the collection was formally opened on June 25th by Sir Henry Miers, F.R.S., Vice-Chancellor of the University of Manchester. Sir John Rose Bradford presided, and among those present was Dr. de Lavis-Trafford, the son of the donor, who is qualified in medicine in France. Johnston-Lavis, who was descended from a Huguenot family, "de

Lévis," received his primary education at the Grammar School, Iver, Bucks. While there, the story goes, a school-fellow threw a stone at him. Young Johnston-Lavis, although in pain, examined the stone with curiosity, and further investigation showed the missile to be a fossil echinoderm. This event stimulated his interest in geology, and the stone formed the first specimen in his collection. In 1873 he became a student at University College, studied medicine at St. Mary's Hospital, and qualified with the M.R.C.S. in 1878. While a medical student all his leisure was devoted to geological studies, and at 18 he joined the Geologists' Association, in the following year became a member of the Geological Society, and at the age of 20 published his first geological paper. The value of geology to medicine was shown in his essay, which gained the Parkin Prize of the Royal College of Physicians of Edinburgh in 1914. This discussed the physics and chemistry of volcanic eruption and the physical effects of eruptions on human beings and animals. For many years Johnston-Lavis was Professor of Vulcanology in the Royal University of Naples and, as Prof. Miers pointed out, he was the very embodiment of the scientific spirit in all the work which he did. The gift forms a permanent expression of the donor's affection for the College and the University.

BENJAMIN BROADBENT.

Benjamin Broadbent, who died on June 25th at the age of 75, was a younger brother of the late Sir William Broadbent and, like him, a forceful person. He will be remembered as a pioneer in child welfare work. For many years chairman of the Huddersfield Health Committee, he entered with enthusiasm into the efforts of the medical officer of health, Dr. S. G. Moore, to save the lives of infants dying from preventable causes in the borough. In 1904 Mr. Broadbent accepted the civic chair for the definite reason that he believed it would give him greater scope for combating infant mortality. He offered a gift of £1, secured by a promissory note, to every baby born in Longwood (where his woollen mills were situated) during his year of office, who was still alive at the end of 12 months, the object being to ascertain where births had taken place, so that they might be followed up. During the year 112 infants were born in that ward, of whom only four failed to claim their birthday present; at the end of ten years 98 were still alive, and only seven were known to have died. The first promissory note was taken to the house by Miss Broadbent, and thus began a system of voluntary home visiting. In the following year the Huddersfield and District Public Health Union was instituted, with Mr. Broadbent as president. This Union, which secured the help of more than 100 volunteers, worked in close coöperation with the Public Health Department. A fee of 1s. offered for any notification of birth received within two days was largely successful, but failed in just those cases where it was most needed, and it was chiefly due to the representations made by Mr. Broadbent and Dr. Moore that in 1906 compulsory notification of births was introduced by Act of Parliament. A fundamental aim of Mr. Broadbent's work for child welfare was to keep mother and child together in the home, and to give help to both. His influence had much weight in the establishment of the National Association for the Prevention of Infant Mortality, for which he drafted the constitution. Again, it was on Mr. Broadbent's suggestion that, at a Mansion House Conference in 1917, it was decided to form a small committee to act in conjunction with Lord Rhondda to go into the question of a Ministry of Health. As recently as July, 1924, two striking articles appeared in the *Times* over the signature of Benjamin Broadbent, showing the results of a careful personal investigation into the "Ten Best Towns" for infant life. He was one of the speakers appointed to take part in the International Summer School to be held at Geneva in August of this year, when his subject was to have been Begin-

nings of Infant Welfare in Great Britain. Mr. Broadbent had the satisfaction, not granted to all pioneers, of seeing the fruits of his labour.

DENICOTINISED TOBACCO.

A NUMBER of people appear to be specially sensitive to the toxic effects of nicotine and its associated alkaloids contained in tobacco. Some of them are deterred from smoking at all; more of them smoke in excess of what they know to be good for their physical and mental efficiency. Dealers have endeavoured to meet the needs of these people by supplying tobacco from which the nicotine has been removed, in whole or in part. We published not long ago, at the request of a business firm, some analyses of the nicotine-content of tobacco treated with a view to reducing the percentage of nicotine. While the flavour and smoking quality remained, as far as we could ascertain, unchanged, it was possible to show that denicotinisation had taken place to the extent of 10 to 20 per cent. It must not, however, be assumed that every so-called "nicotine-free" tobacco placed on the market is in fact such, for a communication has recently been made¹ by Dr. L. Frank, scientific member of the Chief Health Office in Berlin, showing that the Chemical Institute attached to the Health Office was unable to confirm the withdrawal of nicotine from a number of tobacco samples so described. In two samples, in fact, the percentage of nicotine was higher in the treated than in the ordinary variety of tobacco as obtained from the same firm before treatment. The increase has a possible explanation in the greater dryness of the treated tobacco. The registered process of denicotinisation in this case appears to consist in the exposure of the tobacco, whether cigars or cigarettes, for a long time to a moist atmosphere, succeeded by a rapid rise of temperature to 150° C. in an exhaust chamber. Whether the unsuccess in the samples examined was to be ascribed to the process itself or to deficient technique in carrying it out Dr. Frank does not pretend to decide, but he does warn physicians not to recommend to their patients the use of cigars and cigarettes alleged to be denicotinised, without further evidence than the maker's assurance.

A RECEPTION will be held at the Royal College of Surgeons of England, Lincoln's Inn-fields, on Monday evening, July 13th, in connexion with the Convention of English-speaking Ophthalmological Societies. Fellows and Members of the College wishing to attend should apply to the Secretary, Mr. S. Forrest Cowell, at the College for cards of invitation before July 10th. The Convention meets from July 14th to July 16th, under the Presidency of Mr. Treacher Collins, Mr. C. B. Goulden (79, Portland-place, W.) being the General Secretary.

THE committee of the Torbay Hospital has received the sum of £100,000 from Mrs. Ella M. Rowcroft for the erection of the proposed hospital and chapel at Hengreave House. The site had already been purchased and this munificent gift will cover the whole cost of building, leaving the committee to raise only the sums for furnishing and equipment. Subscriptions have already been received and the donor hopes that the required amount may be completed before the hospital is opened, and also that there may be a sufficient surplus to form a substantial foundation for an endowment fund. The only conditions of the gift are that the chapel shall be erected in accordance with a plan and specification to be approved by the donor and shall contain a special window chosen by her, and that no vivisection or cognate treatment shall be permitted on the premises. An additional £6500 are provided to endow the stipend of the chaplain. A special effort is to be made to raise a further sum of £26,000 for endowment. The work is to be put in hand without delay.

¹ Deutsch. med. Wochenschr., 1925, i., 484.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXIX.—THE TREATMENT OF ABDOMINAL ADHESIONS.

THE scope of this paper is limited to a consideration of abdominal adhesions secondary to inflammatory processes or to operation, and does not include the various recognised types of colonic adhesions whose sites and appearances are constant—e.g., Jackson's membrane.

Inflammatory Adhesions.

In the first place, we must recognise that the formation of adhesions following inflammation of, or operation on, abdominal organs is a natural and life-saving process. It is only when these adhesions interfere with the normal functions that the patient seeks advice and treatment.

Adhesions which result from inflammation may cause severe symptoms of acute or subacute obstruction, and these are more liable to occur following a lesion in the lower abdomen. While in some patients symptoms supervene shortly after the acute attack, others may enjoy many years of unimpaired health before symptoms supervene. Cases are frequently seen in which the signs strongly suggest cancer of the colon and in which it is difficult to estimate the true significance of a history of "a bad attack of inflammation of the bowels" 15 to 20 years previously. Tuberculous adenitis of the mesentery is not an infrequent cause of acute or subacute obstruction, either by the formation of bands stretching across the abdominal cavity from the infected gland, or by actual attachment of the bowel to the gland. In cases of the latter type the prognosis ought to be guarded, because frequently the gland is acutely inflamed as the result of secondary infection from the bowel, and its close relationship to the large mesenteric vessels makes the development of thrombosis, embolism, or generalised infection fairly probable. The development of inflammatory adhesions tends to mask the signs and symptoms of the original lesion. For example, when a gastric or duodenal ulcer has become adherent to neighbouring organs the regularity of the appearance and disappearance of the pain in relation to the taking of food becomes less noticeable and is replaced by a continual discomfort or dragging pain. The seasonal remissions from pain also become incomplete or altogether absent.

Traumatic Adhesions.

After every abdominal operation a certain degree of peritoneal adhesions necessarily occurs. In the majority of cases no signs or symptoms result. In other cases discomfort develops and the surgeon must carefully consider whether at the primary operation an important lesion had been overlooked or has subsequently developed—e.g., a duodenal ulcer or gall-stones in a case on which appendicectomy has been performed—or whether in a neurasthenic patient operation has been performed on insufficient evidence owing to exaggeration of the original symptoms.

The "Adhesions Diathesis."

In the treatment of adhesions there is no difference between those of inflammatory or traumatic origin except, of course, that the former call for more urgent treatment of the primary focus, increase the difficulties at operation, and may cause a more prolonged convalescence. A great deal of experimental work has been done to try to elucidate the causes of post-operative adhesions and to devise methods for their prevention, but progress has been slow and unsatisfactory. Sepsis of low virulence, excessive trauma, and incomplete hæmostasis are without doubt

important predisposing factors. In certain other cases an "adhesions diathesis" is said to be the cause. It is well known that certain individuals may suffer from acute and widespread peritonitis, that the abdomen may be opened, swabbed, packed, and drained without the development of any subsequent trouble from adhesions, while a slight and strictly limited operation in other cases may lead to prolonged crippling and suffering.

Points of Technique.

Strict attention to the established rules of surgical technique will greatly reduce the number of cases of "adhesions diathesis." Injury to the visceral and parietal peritoneum by mechanical or chemical means occurs all too easily, and in the subsequent repair harmful adhesions may result. It is now generally believed that the use of iodine or picric acid in the preparation of the skin is not conducive to the formation of adhesions if ordinary care be taken to protect the intestines from escaping outside the abdominal cavity. The use of strong disinfectants for lavage or for the moistening of packs is, however, to be strongly condemned. Undue exposure of the intestines to the air causes an injurious drying of the peritoneum and predisposes to the development of adhesions. Opinion is divided as to whether packs ought to be used dry or moistened in saline. In experimental work on guinea-pigs no marked difference between the two methods was noted, but the observations were not conclusive because in neither group did extensive adhesions develop. The use of rubber dam or jaconet to protect the intestines from the gauze is theoretically of advantage but mechanically is difficult to apply. All raw or bruised surfaces should be carefully and systematically covered by normal peritoneum whenever possible. The use of detached pieces of omentum to cover denuded surfaces is of doubtful value, as Mann¹ has shown that they quickly become converted into fibrous tissue with all its tendency to contraction and adhesion. The graft also shows very poor resistance to septic invasion. The use of undetached great omentum, the lesser omentum or ligamentum teres to cover raw surfaces is more likely to be of permanent benefit, but care must be taken that no undue strain is put upon these structures, or trouble will supervene, particularly after an operation in the lower abdomen, where a short omentum has been pulled down to protect the posterior surface of the wound.

Introduction of fluids such as liquid paraffin, vaseline, and gum acacia in gelatin into the abdominal cavity has not proved of practical value in the prevention of adhesions, nor has the introduction of oxygen after closure of the wound. In closing the abdomen care should be taken to evert the cut edges of the posterior rectus sheath and parietal peritoneum, thereby minimising the raw surface to which bowel may become adherent. Attempts have been made to overcome the harmful effects of adhesions by the early induction of peristalsis. Pituitary extract, eserine, and hormotone by hypodermic injection, and aperients injected into the bowel at operation or given by mouth soon after operation have been advocated. It is doubtful, however, if any of these methods can have a direct action on the bowel, which remains temporarily paralysed as the result of handling for about 24 hours; by this time the "glueing" together of coils of intestines by lymph will have laid the foundation of fibrous and permanent adhesions. All that can result is a drawing out of the fine adhesions before permanent deformity of the gut has occurred.

Relief of Post-Operative Pain and Discomfort.

Regulation of the bowels by suitable diet, regular habits, aided by mild non-irritating aperients, such as liquid paraffin, and massage, together with the assurance that the pains and aches are only temporary, will lead to a cure in many cases. In more resistant cases the use of heat in the form of hot fomentations

or of "radiant heat" will be found to give considerable relief. Some patients complain of pain and dragging in the wound itself, and it is frequently difficult to determine whether the "fons et origo mali" is in the abdominal wall or is the pull of adherent intestine on its posterior aspect. The distinction may sometimes be made by observing whether or no the injection of novocaine into the abdominal wall gives immediate relief. If the point of pain or tenderness is well localised in the wound the use of a counter irritant—e.g., emplastr. epispasticus or the injection of 20 to 40 c.cm. of normal saline into the abdominal wall—will be found to be very beneficial in some cases.

Operative Measures.—Should symptoms persist, and particularly if signs of acute obstruction develop, operation is called for and should on no account be postponed, in spite of the natural objection to a second operation. Very extensive interference with the blood-supply of the small intestine may rapidly and insidiously take place in a patient suffering from abdominal adhesions. Repeated attacks of vomiting, a tongue tending to be dry and coated, with perhaps some slight distension of the abdomen, are enough to justify exploration without waiting for other text-book symptoms of obstruction. A large incision should be made extending well beyond the limits of the scar of the previous operation in order to expose an area of peritoneum which has not been injured previously and to which it is unlikely the abdominal organs have become adherent. The opening into the peritoneal cavity should be made slowly under direct vision, unobscured by blood, and with a sharp knife in preference to scissors. By using this method injury to a knuckle of bowel which may, perchance, be adherent will be recognised before its lumen has been opened and another area further from the original wound selected. After the peritoneal cavity has been opened and the original wound reached, the cutting must be done with great care as a segment of intestine is frequently adherent to the posterior surface. In some cases a narrow band will be found to be the cause of the trouble and its ligature and division is all that is necessary. The more difficult cases, however, are those which show widespread adhesions, and it is often difficult to determine which of these is giving rise to trouble. Extensive "glueing" of the segments of the bowel does not cause symptoms, and one must look for the sharp angulation or narrowing which is the responsible factor. A loop of bowel showing dilatation and hypertrophy may be of great help in guiding one to the proper quarter. In the separation of adhesions I would again emphasise the advantage of a sharp knife used cautiously in place of scissors or any form of blunt dissector. All raw surfaces must be covered as well as possible and all bleeding stopped. Accidental punctures into the intestine or wounds involving its serous and muscular coats must be carefully closed, while in cases of extensive damage resection of the segment may be the quickest and most efficient method of treatment. Drainage should not be employed unless there has been persistent and uncontrollable oozing of blood or extensive soiling of the peritoneal cavity, as the presence of a foreign body predisposes to the formation of further adhesions.

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UNIVERSITY OF BRISTOL.—The Markham Skeritt Memorial Prize has been awarded to Macdonald Critchley, M.D. Bristol. This prize was founded in memory of the late Dr. Markham Skeritt and is awarded every three years to that medical member of the University of Bristol who, in the opinion of the board of the medical faculty, has in the previous three years published the best original work in any branch of medical science. During 1924 Dr. Critchley has published the following papers: The Parkinsonian Syndrome (*Bristol Med.-Chir. Jour.*), Present Position of Parathyroid Therapy (*Pract.*), The Calcium Content of the Cerebro-spinal Fluid (with O'Flynn) (*Brain*).

¹ Mann: Surg. Clin. of N. Amer., 1921, i.

Special Articles.

THE ANOPHELES MOSQUITO IN ENGLAND.

By A. W. ALCOCK, C.I.E., F.R.S.,

LT.-COL. I.M.S. (RETD.); LATE PROFESSOR OF MEDICAL ZOOLOGY IN THE UNIVERSITY OF LONDON.

DIFFUSION of knowledge of the fact that the malaria parasite undergoes in the anopheles mosquito those necessary stages of development that fit it for passage from one human being to another has not been accompanied by a corresponding understanding of the necessary circumstances in which this potential danger from the insect becomes realised in a general onset of malarial fever.

Imagining that both the anopheles and considerable numbers of relapsing malaria convalescents are recent introductions into these islands, and that the malefic powers of the insect are unconditioned, the public seems quite ready to believe the alarming prophecy that a general outbreak of malaria is impending in this country unless immediate steps be taken to exterminate the anopheles. It is necessary, therefore, that the public should understand that anopheles mosquitoes are as native to this country as the sparrows and the starlings; that malarial fever—known to our forefathers as “fever and ague”—is also native here, but from having been in former times extremely common is now almost extinct as a native disease, notwithstanding the constant re-introduction of malaria parasites in the blood of convalescents annually returning from India and other parts of the tropical dominions; and that this gradual process of extinguishing malaria was carried well the right side of the public safety-point without any attempts at exterminating the anopheles mosquitoes, and, indeed, long before the malaria parasite and its vital associations with a mosquito of any sort had been discovered. It is advisable, in short, that the public should be taught as a most conspicuous illustration of the value of sanitation, how, in a country that possesses an efficient sanitary administration, a creature so potentially dangerous but so difficult to exterminate as the anopheles mosquito can be permitted to exist, in its proper natural stations, without menace to the public health.

Native Village and Modern City.

That the nature of the sanitary environment is the main factor in determining the influence of a potentially dangerous species of anopheles upon the public health is easiest understood by comparing an unsophisticated native village with a modern Anglicised city—both situated in a malarious tropical province—by comparing, for instance, an ordinary village in Lower Bengal with the European quarter of Calcutta. The native village, more or less obstructed by jungly growth, stands on soil that for much of the year is waterlogged; the surface of the ground is broken, so that, as there is no drainage, every chance hollow may be a temporary nursery of anopheles during the rainy season; moreover, there also are innumerable permanent breeding-grounds. Above all, the clusters of thatched, cow-dung-plastered huts and *baris*—damp, dark, ill-ventilated—in which the most part of the people live, are ideal haunts and permanent harbourage for the adult anopheles. In such conditions the villagers and the anopheles live together in close intimacy, and the swiftly succeeding swarms of anopheles must always be sucking the blood of infected human beings and returning the infection indiscriminately to the village population.

The state of Calcutta at the end of the eighteenth century, as described by Busteed, seems to have been almost worse than that of a Bengal village. The houses of the Europeans may have been large, but

they had not glazed windows, and the entire settlement “at this time stood in what was little better than an undrained swamp, in the immediate vicinity of a malarious jungle . . . and the ditch surrounding it was . . . an open cloaca.” Even into the early part of the nineteenth century the place was known as a white man’s grave. But before the end of the nineteenth century the European quarter of Calcutta, so far as the essentials of sanitation are concerned, had attained the standards of a high civilisation: insanitary native *bustees* had been cleared away, ways and spaces were well kept, surface drainage was sufficient, and the drainage of the neighbouring *maidan* was magnificent. The tanks, or reservoirs, which in early days had been the water-supply of the city, still remained as more or less ornamental relics, and still served as breeding-grounds for plenty of anopheles mosquitoes, and among them the dangerous *Anopheles funestus*; but dry and well-ventilated rooms are not attractive to anopheles, and these insects did not make their way into well-constructed houses, so that good authorities doubted whether primary cases of malarial fever originated any longer in the European quarter of Calcutta. We must consider what is likely to happen to such insects as still might get into rooms so unsuitable to their taste. Are they as likely to bite human beings—or to light upon an infected human being—as they would be in a native village? Are they likely to remain in a situation so inhospitable long enough to develop an infection (10 to 20 days) if it were acquired? Such a favouring concurrence of events is likely to happen only where large numbers of anopheles and large numbers of infected human beings exist for a considerable time in constant association in an environment that suits the insect.

Story of Malaria in England.

To estimate present-day possibilities of danger from our native British anopheles we have to consider the history of malaria in England in the light of the foregoing comparison. The result will be to show that in the old pre-sanitary days, when the state even of cities like London was almost as bad as that of an Indian village, “fever and ague” was extremely common here, and that with the progress of sanitation it disappeared except as an insignificant localism—and all in entire ignorance and unconcern of the anopheles mosquito.

It is doubtful whether it is now generally realised how common malaria was in this country—and even in London—in the days of our forefathers. The bill of mortality for the London area for the year 1665 included 5257 deaths from “fever and ague” in a population that must have been less than one-tenth of what it is now; and if it be objected that this was the year of the Great Plague, when deaths from that disease might have been deliberately concealed under a less fearful name, it may be replied, on the other hand, that the spring and summer of that year were seasons of a phenomenal drought that would have played havoc with mosquitoes. But there is no need to search for inaccessible records; books familiar to every educated Englishman—the “*Canterbury Tales*,” the plays of Shakespeare, the diaries of Pepys and of Evelyn, and Swift’s “*Journal to Stella*”—give us plenty of information on the subject. An evil that comes most readily to Chaucer’s imagination in “*The Nun Priest’s Tale*” is a “fevere terciane, or an agu, that may be your bane.” What with direct speech and metaphor there are more than a dozen striking references to ague and quotidian shakings in Shakespeare’s most familiar plays. Pepys’s business was several times hindered by “my lord’s” ague, and one of his merry parties was interrupted by the ague-fit of a lady guest. Evelyn has a good deal to say about Charles the Second’s ague; he tells of one dangerous attack when the king insisted on having the new remedy “*quinquina*”; he describes his own little son’s death at Deptford from “a quartan ague”; and he gives a full account of the popular cure—bathing the legs in milk as hot as could be borne and drinking

carduus posset—by which he cut short one of his own attacks of ague. Swift, writing in 1711 from Chelsea, tells Stella that “people here are troubled with ague . . . which is a very common disease here,” even Queen Anne and Lady Masham not escaping; and he chuckles over his pun on the fellow who “pretends to cure agues, and has set out a sign, and spells it ‘egoes’ . . . but I was sure [the cure] was not by a spell.”

Change in Sanitary Environment.

Again it is doubtful whether a generation familiarised with sanitary conventions from its cradle realises what our forefathers endured in consequence of their ignorance and indifference in matters of sanitation. What London itself was like in the latter part of the seventeenth century—and there is no good reason for supposing that it was worse than other British towns—is tersely described in Mr. W. G. Bell’s recently published book on “The Great Plague in London in 1665”; the description well suffices to explain the prevalence of fever and ague at that time. In the absence of drainage there must have been a profusion of temporary breeding-places for the anopheles among the crooked, obstructed, unpaved ways, and domestic wells and ill-kept streams must have provided permanent breeding-grounds in plenty; while dark, damp, ill-ventilated rooms, in houses constructed largely of wood and confined by accumulations of garbage, must have been attractive harbours for the adult anopheles.

When the sanitary environment of the present time is contrasted with this domestic and civic indifference of those pre-sanitary days it is easy to understand how an intimacy between humanity and anophelinity has been broken, and how, in consequence, malaria has disappeared from this country, except here and there within the limits of a few scattered and rather “wild” areas whence a case of indigenous malaria is occasionally reported as an interesting curiosity. With this conquest over malaria there has not been a concurrent subjugation of the anopheles. Those now innocuous insects may not perhaps exist to-day in the City of London, but all the three British species—*maculipennis*, *bifurcatus*, and *plumbeus*, all of them susceptible to malarial infection—exist in fair numbers within the residential area around London, and at least two of them exist in great numbers in certain populous country districts.

Contributory Mitigating Influences.

Before considering exactly how a sanitary environment has managed, quite accidentally, to separate anopheles from mankind in this country, certain other factors that must have helped to mitigate the risk from the insect as this separation progressed must be taken into account.

First there is the limited infectivity of the insect in our variable climate. Whatever may happen under conditions of temperature and humidity that can be controlled in the laboratory, it is certain that the proportion of insects that develop an infection when left exposed to natural influences after feeding on a suitable malaria patient is in this country very inconstant, and may even be as low as 3·3 per cent. of a considerable batch. It appears, indeed, that if it could be imagined desirable to attempt to make our British anopheles generally infective under the sanitary regimen of the present day, the attempt could get fairly floated only in a summer having fairly long spells of weather that is hot without also being dry. But, as any ordinary proposition, it is obvious that as the numbers of anopheles diminish with the disappearance of temporary breeding-places by drainage, this variable infectivity of the insect in a variable climate would tell in reducing malarial fever.

Then there is the protection afforded by domestic animals. Roubaud, in France, attributes the absence of malaria in parts of that country where the anopheles are abundant (*anophélisme sans paludisme*) to the increase of domestic animals, particularly cattle, and

more particularly stalled cattle. He has gone so far as to assert that in some such districts the anopheles have become functionally and even structurally adapted to cattle (*zoophile*) and have developed a correlated aversion to man. There is, however, no general concord of evidence that the insect prefers the blood of cattle to that of horses, or pigs, or rabbits, or man, though there would perhaps be more general agreement that it prefers a cattle-shed or a stable even when empty to a well-constructed house even when it is inhabited.

The Two Outstanding Factors in Prevention.

From this last promontory can be seen the two outstanding items of sanitary progress that most seem to have worked together in ridding this country of malaria and preventing its reintroduction in spite of the abundance of susceptible anopheles—namely, drainage and generally improved housing. The importance of drainage in restricting breeding-places and drying the soil is too well understood to require further comment. But the equal importance of dry, light, airy houses seems to have been realised only by Dr. C. W. Daniels, Colonel S. P. James, and a few others. And yet there are some facts of common observation that suggest the influence of the house. There is the significant fact that in certain Indian cantonments—and these not notoriously malarious—there may be (or once was to be) found some one particularly malarious house having the opprobrious name of “Fever Hall.” Colonel James, too, has emphasised the existence in the Medway estuary of little nests of native malaria focused in a particular street, or a particular house where the anopheles make themselves at home. Conversely, there are places not a few, in the residential area around London, where anopheles larvæ are to be found in any pond and adult anopheles in any cowshed or stable, though search for an anopheles in the excellent modern residence close by would be vain. Moreover, there is more than one salubrious spot within a few hours of London—once ague-stricken, but where ague is now a vague and almost obliterated tradition—in which in July 50 anopheles larvæ may be taken from a stream at one dip of a cup, and in October adult anopheles innumerable may be caught in a cowshed or a stable though none will be found in well-built and well-kept houses not a hundred yards distant. Why anopheles is so susceptible to the effects of a dry atmosphere is a biological question that does not seem to have been investigated; the absence (in all the British species) of the thick coat of scales possessed by other kinds of mosquitoes may have something to do with it. But there is nothing strange in its shunning a particular sort of house close to its haunts; there are several other kinds of blood-sucking flies that show the same discrimination.

Conclusion.

The conclusion of the whole matter is that it is chiefly an absence of a sanitary environment that makes anopheles dangerous, just as it is chiefly an absence of a sanitary environment that makes the generality of germ-carriers and germs dangerous. In places where the sanitary environment does not exist—e.g., most rural areas in the tropics—and in expeditionary camps, where the natural environment may have to be defied, anopheles is a danger that requires prompt and special attention. But in places like these islands, where an efficient sanitary service is maintained, anopheles is *not* a real danger to the public health, and as also it is *not*, like certain species of *Ochlerotatus* and like *Culex pipiens*, an ordinary nuisance—since it may be found, by search, in swarms where the inhabitants are quite ignorant of its existence—any deliberate attempts to exterminate the insect would truly be *ἀνοφελής*, or, rather, *ἀνοφελίστατος*, that is to say, most unprofitable; for such attempts would give endless annoyance to farmers, who have quite enough trouble to put up with as things are, and also would tend to shake public confidence in the established sanitary administration.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 1349.)

MEDICAL SERVICES IN THE FACTORY.

Evidence of Sir T. M. Legge, M.D.

(App. XLII. and Q. 13515-13726.) Sir Thomas Legge, Senior Medical Inspector of Factories, gave evidence not in an official capacity but as embodying his personal views. His principal contention was that, although the worker in the factory went to his panel doctor when he became ill, there was no provision whereby the clinical knowledge of the insurance doctor was utilised in preventive work in the factory. He showed this by a chart with arrows pointing away from the factory and the workshop indicating that the workers stream from the factory to their panel doctors when they become ill. There was no return stream from the panel into the factory to try to prevent sickness claims arising there, which must ultimately fall on the National Health Insurance Funds. The duties of the factory surgeon were merely to certify fitness or disablement. The witness was sure that there was no chance of the creation of a new whole-time service of medical men as factory surgeons in this country.

The only way . . . in which the services of those who have the clinical experience suitable for the medical supervision can be obtained is, I believe, by some broadening of the National Health Insurance Act, so that in industrial areas certain practitioners should be given, as their panel work, the duty of keeping the industrial workers as far as possible from succumbing to illness and so becoming a charge on the insurance funds.

The witness said that he thought that both employers and trade-unionists would welcome medical supervision in the factory by a medical man for whose services they both contributed. Sir Thomas Legge urged the importance of including within the medical curriculum the relation of occupation to health, and said that much of the sickness and incapacity among the workers was preventable.

I do not regard industrial hygiene and industrial medicine as an entity in itself, but simply as a specialised part of general medicine and surgery, from which they cannot properly be detached. Early clinical evidence of disease predisposed to, accentuated, or produced by, industry is wanted (1) for diagnosis, (2) for prevention, and (3) for treatment.

THE MINISTRY OF HEALTH INQUIRY ROOM.

(App. XLI. and Q. 13412-13514.) The clerk in charge of the inquiry room at the Ministry of Health

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247-8); The Provision of Medical Benefit (Feb. 7th, pp. 301-3; Feb. 14th, pp. 355-6; Feb. 21st, pp. 403-5); Financial Provisions of the Act (Feb. 28th, pp. 454-7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508-9); The Approved Societies and the Money Benefits (March 14th, pp. 564-5; March 21st, pp. 623-4); Evidence of the Hearts of Oak Society (March 28th, pp. 677-9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731-3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784-6; April 18th, p. 839); Evidence of Mr. Alban Gordon (April 18th, pp. 839-40); Evidence of Joint Committee of Approved Societies, of Stock Exchange and Lloyds' Health Insurance Societies, and of Group of Catholic Approved Societies (April 25th, pp. 889-91); Evidence of the National Insurance Beneficent Society (May 2nd, pp. 943-4); Evidence of the British Medical Association (May 9th, pp. 993-5); Evidence of the British Dental Association and other Dental Organisations (May 16th, pp. 1044-6); Evidence of the Insurance Committees (May 23rd, pp. 1097-8); Evidence of Various Approved Societies (May 30th, pp. 1135-6); Evidence of the British Medical Association (June 6th, pp. 1184-6; June 13th, pp. 1248-50; June 20th, pp. 1315-6); Evidence of other Medical Bodies (June 20th, p. 1316; June 27th, p. 1348); Individual Evidence (June 27th, p. 1348).

References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

gave evidence with regard to the number of inquiries which he received in the course of the year. The average number of personal calls is 3000 and there is a similar number of telephone calls. Surprisingly few complaints against the medical service are received, and it has been noted that with very few exceptions those persons who speak to the detriment of the insurance medical service have never been under the treatment of a panel practitioner.

NATIONAL SAILORS' AND FIREMEN'S UNION.

(App. XLIII. and Q. 13954-14058.) Mr. T. Chambers, who is in charge of the work of the union as an approved society, said that it was a registered trade-union with a membership of 58,000. The seafarer must always be a special problem within every national industrial problem. The method of collecting contributions from seamen appears from experience to be unsatisfactory. Numbers of men lose their cards or destroy them altogether, and this results in loss of credits to the Society and loss and inconvenience to the member when he is claiming benefit. The witness made suggestions for meeting this difficulty, involving the abolition of the contribution card system. Although he said that he saw grave difficulties in the way of segregating the whole body of seamen in one approved society because of the changes in employment, he thought that if this step were taken, it was essential that the Society should be under the control of its own members—in other words, the National Sailors' and Firemen's Union was quite competent to be that Society.

As to medical benefit for seamen, the witness saw no reason for any special arrangements, and said that their members who came under the ordinary machinery of the Act never made any complaint that they experienced difficulty in getting medical attention when they needed it. The Society pays less into the general medical benefit pool in respect of its members, because it gets a rebate for the periods in which seamen are abroad. This sets funds free for other benefits, and the Society give dental treatment including a contribution of about one-half towards the cost of dentures.

LOYAL ORDER OF ANCIENT SHEPHERDS.

(App. XLIV. and Q. 14059-14250.) This is a friendly society with branches called lodges. Evidence was given by Mr. John Grieve and Mr. A. J. E. Saunders. It followed in many respects evidence given by other friendly orders, including the objection to pooling surpluses, and the favouring of a limitation of additional cash benefits. The evidence contains a suggestion that the income limit for compulsory National Health Insurance should be raised from £250 to £350, on a level with the limit in the Workmen's Compensation Act, but the witnesses were unable to say that they were aware of any real demand for this.

In view of the expectation that the Society could give dental benefit out of surplus, they suggested that priority should be given in any development to the treatment of dependants.

We are of opinion that a first step towards the establishment of a public medical service could be made by extending medical benefit to dependants of insured persons. We believe our members would be willing to pay an increased contribution for this purpose. The average man is more concerned to know that his dependants are provided with proper medical attention than he is about himself. Since the inception of National Health Insurance, although entitled to free medical attention for himself, he finds it more difficult to provide for his dependants owing to the increased fees now charged by the medical profession for private service.

This Society thinks that serious consideration should be given to the possibilities of administering workmen's compensation on lines similar to National Health Insurance. A suggestion in the evidence that medical umpires should be appointed to settle questions in dispute between the panel doctor and the regional medical officer gave rise to a lengthy examination of the witnesses as to the merits of such a proposal. It was suggested to them that their object was merely to

relieve themselves of the responsibility of determining in the light of the medical evidence whether a member should continue to receive benefit on the ground of incapacity for work. They said that their difficulty arose from the fact that the regional medical officer was not empowered to give a decision. He too often evaded the issue or left it too vague. They agreed that if he was able to give a decision they would not need the suggested umpire.

MEDICINE AND THE LAW.

Medical Evidence in Accidental Deaths.

A CORRESPONDENT asks our opinion on the following occurrences: (1) A man falls from a roof, fractures his skull, and is killed instantly. (2) A man commits suicide by a gas oven and dies. On both occasions a doctor was sent for and went, and in each case an inquest was held, but no medical evidence was called. It appears that a coroner is not obliged by law to call medical evidence in cases where apparently it can add nothing material to what is known as to the cause of death. No doubt medical men will not always believe that he has acted with discretion in having no medical evidence given. Mr. R. Henslowe Wellington, himself a medical coroner, wrote in 1906 ("The King's Coroner," vol. ii., p. 23): "It is not always necessary to have medical evidence at an inquest, so that the expense of calling it should not be incurred unless the coroner is satisfied that a skilled and scientific examination is necessary in order to determine the cause of death," and (p. 68) "The immediate cause of death may be shock, due to being knocked down or run over by a train, and the remote cause as to who if anyone was to blame for the death; or a person may have been seen to throw himself from a height, or deliberately cast himself into a river and drown." The object in calling medical witnesses in all such cases—namely, the elimination of other causes of death than the obvious one—could only be attained by post-mortem examination, and generally speaking would hardly be worth the expense. But a man might have died of heart failure before falling off a roof or before the gas in a gas oven operated sufficiently to kill him, and this would be worth finding out in the case of an accident if a question of insurance turned on it. In such a case, however, medical evidence would be called, unless there was independent evidence proving an accident. The medical man summoned to an inquest and not called is, of course, entitled to his fee. The Act says (Coroners Act, 1887, Sec. 22): "A legally qualified medical practitioner who has attended at a coroner's inquest in obedience to a summons of the coroner under this Act shall be entitled to receive such remuneration as follows—" which evidently contemplates the conditions described.

A Question of Time-limit.

An important decision affecting the time-limit within which actions can be brought against the officials of public authorities in connexion with the performance of their official duties was given in the Divisional Court in the case of *Freeborn v. Leeming*. The plaintiff, Mr. G. Freeborn, injured by a motor-car, was treated in the Kendal Workhouse Infirmary by Dr. R. Leeming, as medical officer to the guardians, from Sept. 5th to Oct. 15th, 1923, when he left by his own wish and went to his home in Lincolnshire. It was there found by other medical men that he had suffered all the time from a dislocated hip, which Dr. Leeming had failed to discover or to treat, and that it was then too late for the dislocation to be reduced. It was found by the county court judge, on Freeborn bringing an action against Dr. Leeming, that there had been negligence, and he awarded £1800 damages, holding that the action, commenced six months and ten days after the plaintiff left the

defendant's care and was not barred by the Public Authorities Protection Act, 1893; the cause of action did not arise until damage resulted to the plaintiff from the negligence, and that such damage only resulted at the time when, if he had been properly treated, he would have been able to return to work. Section 1 (a) of the Act in question provides that an action shall not lie "unless it is commenced within six months next after the act, neglect, or default complained of, or, in case of a continuance of injury or damage, within six months next after the ceasing thereof." Mr. Justice Salter (with whom Mr. Justice Swift agreed) held that the county court judge had decided rightly that the words "a continuance of injury or damage" meant a continuance of the act which caused the damage (*Carey v. Mayor of Bermondsey*, 20 Times L.R. 2), but that he was wrong in holding that no damage occurred in the case of the plaintiff until within six months of the commencement of the action. It was argued that if the dislocation had been reduced the plaintiff would have had to remain in bed for several weeks, and that therefore during such a period he suffered no damage. His lordship however, held that this was not so, but that the damage began to accrue from the time when the failure to discover the dislocation took place, the result of the failure being that during the time that followed it the plaintiff was becoming worse instead of better. His lordship on these grounds gave judgment allowing the appeal, and expressing regret that he had had to come to that conclusion.

The Medical Witness's Fee.

Dr. X was recently subpoenaed to give evidence on behalf of the plaintiff in a claim for compensation after an accident. The plaintiff won his case, and Dr. X is informed by the plaintiff's lawyer that he is entitled to a fee of 1 guinea plus 5s. expenses, but, as the defendant has not yet paid costs, Dr. X has not yet come by his money. Hitherto he has always been paid 2 guineas a day for attendance at court. Should he remain unpaid, Dr. X would like to know on whom he has any legal claim, and for how much. Speaking generally, costs of witnesses are fixed by a taxing-master or by the registrar of the county court, according to prescribed scales, with certain discretion. Presumably the solicitor was right in this case in his statement of the amount due to Dr. X after taxation, and if and when the defendant pays Dr. X will receive that sum. In the absence of any agreement for remuneration beforehand, he is unlikely to obtain more unless the plaintiff chooses to pay more. Should Dr. X find himself unable to get payment in any other way, he can claim against the plaintiff, but in that case it would be prudent to ascertain first whether the plaintiff is able to pay if he has received nothing from the defendant. Certain obvious precautions should be taken by a medical man when called upon to give evidence in a court of law. When a subpoena is served on him, he should ask for "conduct money" to which he is entitled before going to court, being not obliged to obey the subpoena until he has received it. If called on in court to give evidence, he can ask to have his fee paid before being sworn, and the judge will then decide what is a proper fee in the circumstances. In most cases, even if not called, he would still be entitled to his fee. Any witness who expects a higher fee than that ordinarily allowed on "taxation between party and party" should arrange the matter clearly then and there if he wishes to avoid disappointment afterwards. Fees thus arranged between witness and client are usually higher than those allowed on taxation.

MANCHESTER ROYAL INFIRMARY. — Sir William Cobbett has resigned the chairmanship which he has held for 21 years on account of ill-health, and Mr. R. P. Goldschmidt has been appointed to succeed him. Sir William Cobbett was knighted at the opening of the new infirmary by King Edward in 1909.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

Food Preservatives and Food Adulteration.

IN the *Medicul Practicant* Dr. Jámboir writes on this subject. He says that the necessity of preserving food in some way had been recognised since ancient times. The development of the science of chemistry had placed in the hands of the manufacturer means of preserving food hitherto unknown and means of matching foods in tints and colours. He believes that the education of the public in regard to artificial colouring of foods would be quite as effective as legislation. After August 1st the new food law requires that all food products entering Roumania artificially coloured shall bear a label with a statement to that effect. The material for colouring need not be declared, except in the one case of sulphate of copper. The chief sanitary commissioner's advice to food makers is to cease using colours, and especially if the colouring is under suspicion of any kind. Concerning antiseptics in relation to foods, he thinks the rights of the consumer are paramount. He believes that there never should be an antiseptic added to foods, except when absolutely necessary, unless the consumer orders it for himself. There is, he thinks, a legitimate use for sulphurous acid as employed in the fumigation of dried fruits, and the burning of the sulphur match in wine barrels, a method which has come down from antiquity, but when it is used, as at present, greatly to excess for preserving a poor wine and putting on the market a new wine before it is aged, such use is unwarrantable. He believes that the application of the principle of honesty would cover all the needs of a food law.

Intestinal Tuberculosis in Children.

A type of tuberculosis occurring in children of farmers is described by Dr. Popovici. It affects principally the intestinal lymph glands and, though rarely fatal, may constitute a grave illness. The children become emaciated, pale, suffer from abdominal pain and tenderness around the umbilicus, headache, insomnia, and slight rise of temperature in the evening. The cervical and submaxillary glands are frequently swollen. The disease may progress very rapidly for a time, and then take on a chronic type, which is more apt to be prolonged in the older children. After the subjective symptoms disappear, anemia and general weakness persist for a considerable period. Dr. Popovici attributes the occurrence of the disease to the fact that there was an epidemic among the cows of the district, and although their milk was wholesome (the epidemic consisting only of the occurrence of some external manifestations) it was nevertheless of very poor quality.

Removal of Large Sharp Bodies from the Œsophagus.

In the Medical Society of Cluj Dr. Koleszár spoke about the difficulty of extracting large sharp bodies from the Œsophagus. He said that external Œsophagotomy is the operation usually advised for their removal. The technique of the operation is difficult and the results are inconstant. It follows from this that if careful extraction can be accomplished through the mouth the results must be better than by operation, especially if operation be in the hands of a somewhat inexperienced surgeon. Dr. Koleszár cites the history of two cases which showed him conclusively that the incision of the Œsophagus for the extraction of foreign bodies, even in apparently desperate cases, might not always be necessary. The technique practised is as follows. The Œsophagus is exposed by the usual incision on the left side of the neck. The incision made is at least 9 cm. in length, or longer if necessary, to give the operator a full view of the Œsophagus. Instead of opening the organ he practises the following method (Kramer's method). While lifting the patient's head forward and pulling the larynx up with

the left hand, he endeavours with two fingers of the right hand in the wound, under the control of the X ray screen, to push the foreign body into a different position in the Œsophagus. After some effort in each case this manipulation proved successful, and he was able to pass the usual slender Œsophageal forceps through the mouth and remove the body which previously had resisted all forms of intrabuccal manipulation. He considers that inasmuch as the statistics show that Œsophagotomy is connected with a very high mortality-rate, any method which enables the operator to remove the body without subjecting the patient to such very high risk must be of great value.

Inflammatory Process of the Sigmoid Flexure.

Dr. Dumitrescu-Mante, lecturer to the University of Bucharest, read a paper in the Bucharest Medical Society on the above subject. He drew attention to the frequency of benign inflammatory processes in and about the sigmoid flexure. As separate and distinct affections these have not received proper study and have frequently been overlooked or else wrongly diagnosed as cancer. They may be acute or chronic and are frequently followed by strictures of a moderate grade. Although extremely troublesome, they are generally amenable to treatment without operation. The use of the barium enema and the sigmoidoscope mark a very great advance in diagnosis, since a great portion of the sigmoid flexure may now be inspected directly by the latter method. Even exploratory laparotomy is often less successful than direct inspection, since the interior of the gut often gives more information than the exterior. It may well happen that the walls of the flexure are thickened to such an extent by simple chronic inflammation that the operator may have considerable doubt as to the nature of the condition. The most common symptoms are pain, irregularities of defæcation, and tenderness. The loop may be palpated as a thickened mass or as a distinct tumour. An acute sigmoiditis may be the result of simple chronic constipation. Fever and general malaise are common here, and occasionally attacks of obstruction, which yield, however, to castor oil and enemata. A mild general infection is probably set up from an acute ulceration or a diverticulum in which the fæces stagnate, with secondary irritation of the peritoneum. Inspection will generally show an cedematous and hyperæmic mucous membrane. If the intestines are distended with air, the sigmoid will not balloon out. In the chronic cases the patients are frequently so cachectic that the diagnosis of carcinoma seems probable. The mucous membranes are also very vascular here, but areas of pigmentation from former hæmorrhages are very common. The stools frequently contain mucus and blood. Follicular inflammation is rare, but may also readily be diagnosed with the proctoscope. The treatment of all these conditions calls for regulation of food and stools, mild astringent irrigations, and tonic drugs.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Annual Meeting of the A.M.A.

ONE of the more important incidents, and certainly the most exciting, of the recent meeting of the American Medical Association at Atlantic City was the discussion of a quarrel now going on between the Judicial Council of the Association and the Life Extension Institute. The latter organisation was incorporated, largely through the efforts of its President, Mr. Harold A. Ley, in 1913. The object of the institute was to encourage periodical medical examinations as a means to study early symptoms, to secure early treatment, and so save life. The Institute, though for several years run at a financial loss, has been successful in promoting the idea of medical examinations, and according to the report of the Metropolitan Life Insurance Company, whose

policy-holders are entitled to free examination by an arrangement with the Institute, it has been notably successful in reducing the mortality-rate among its clients. In the year 1923 a dividend of $3\frac{1}{2}$ per cent. was paid on the preferred stock. Apparently it is only within the last two years that the officers of the American Medical Association have taken umbrage at this campaign. At the last annual meeting in Chicago the Judicial Council issued a report on the practices of certain "commercial organisations." The Life Extension Institute believes that it recognises references to its own procedure in this report and has printed a refutation in parallel columns of the statements in this report which it says are untrue. This year the Judicial Council is called on by a resolution in the House of Delegates—a resolution which warmly resents the imputation of dishonesty made by the Life Extension Institute—to present information or proof that will vindicate its position, "so that suitable action may be taken by this House."

On the motion of the Reference Committee on Reports of Officers, the following resolutions were carried:—

Resolved.—That it is the sense of this House of Delegates that periodic health examinations should be conducted by medical men and neither dominated by, nor controlled by, lay organisations, for the reason that the relation between the patient and the physician is an individual matter and anything that disturbs such relationship is detrimental to the best interests of the patient; and it is further

Resolved.—That it is the sense of the House of Delegates that every Fellow and Member of the American Medical Association should live up to the spirit and letter of this resolution.

If these resolutions should be carried out it is obvious that the Life Extension Institute would disappear. Actually two members of their Hygiene Reference Board have resigned, but the remainder, including some of the most prominent members of the American medical profession, seem to be standing behind the organisation. The indications are that the Institute will survive, and continue to work both for private applicants and for the life insurance companies.

Medical Education.

The report of the Council on Medical Education and Hospitals includes some interesting figures. In 1900 there were 160 medical schools in the United States—more than half the world supply. In all but about 30 the entrance requirements were absent or nominal; many schools had no laboratories and were not even attached to hospitals. Now, of the 70 medical schools teaching clinical subjects 34 have their own teaching hospitals and 30 have access to other hospitals by which satisfactory clinics are being regularly held. Seventy-five colleges, or 93.7 per cent., have entrance qualifications "similar to those of the rest of the world." The expense of maintaining these colleges has naturally increased. Students' fees have been raised, but even now cover only one-quarter of the increased expense. The number of approved post-graduate schools has increased from 20 to 50 in the last ten years.

WOMEN'S MEMORIAL IN YORK MINSTER: UNVEILING CEREMONY.

THE Five Sisters window in York Minster, in memory of women who gave their lives for their country in the war, was unveiled on June 24th. During the war bombs fell so near the Minster that it was decided to remove and bury the windows. It was then discovered that the glass was perishing, and the Dean sent out an urgent appeal for financial assistance to save it. So far no memorial had been erected to all the women who gave their lives in the war, and the idea arose that to save the Five Sisters window, which has always been associated with women, would be a suitable memorial. The subscription list was headed by Princess Mary with £50, and

followed up by varying sums from all classes; one old age pensioner gave her weekly 10s. Within nine weeks over £3000 had been received, so that it was possible to erect in addition an oak screen with a roll of honour containing the names of the women commemorated, in such a position that the light shining through the window falls on the names on the screen.

The window occupies the entire end of the North Transept. It is formed of five lancet-shaped lights with a pointed panel above. Each light contains 12 panels of glass, each about 5 ft. broad by 4 ft. high. The ground-work of the whole is of whitish-green glass on which is painted in brown enamel a continuous pattern interrupted by insertions of coloured glass of different colours in geometrical designs. This style of glass is known as grisaille and the Five Sisters window contains the greatest quantity of it in existence at the present time. The name has been derived from the story, which may be true or only a legend, that five sisters who lived near York Minster embroidered tapestries of such beautiful design that the maker of the window used the designs for his glass. The window dates from the thirteenth century, but until the unveiling on June 24th, the glass has been so altered that it has not been seen in its true colours except when it was new. The lead used for the restoration was given by the owner of the old Abbey of Rievaulx in Yorkshire, and by a happy coincidence is also thirteenth century lead.

The screen has been placed in the St. Nicholas Chapel near to the window. It is made of oak which belonged to the Minster. The upper part of the screen is perforate, the lower part consists of 12 panels on which the names of the 1400 women commemorated are inscribed. Each panel is covered by a door which has to be opened before the names are revealed. Panel 6 contains the names of the women doctors, Scottish Women's Hospitals, Endell-street Military Hospital, and the auxiliary hospitals. The names of the medical women on the panel are: Dr. Laura Foster, Dr. Elsie Impey, Dr. Sybil Leonie Lewis, Dr. Isobel Addu Tate, Dr. Marion Wilson, Dr. Elsie Maud Inglis (founder of Scottish Women's Hospitals), Dr. Louisa Woodcock.

On the outside of the door of the panel is the emblem of the medical profession, the rough stock with the twisted serpent.

Deputations from all branches of women's war service attended the ceremony, including the following medical women: Miss Frances Ivens, representing the Medical Women's Federation; Dr. A. C. Scott, Delhi; Dr. M. G. Brodie, Durham; Dr. I. J. Fowler, Halifax; Dr. M. Keyes, Dr. K. E. H. Rutherford, and Dr. L. Veale, Harrogate; Dr. D. P. Priestley, Dr. A. W. Somerville, and Dr. C. Stewart, Leeds; Dr. R. Nicholson, Liverpool; Dr. J. H. Turnbull (Ministry of Health), London; Dr. E. Stone-Milestone, Sheffield; Dr. H. A. Wilson, Wakefield; Dr. J. S. Baugh, Dr. E. M. Creak, Dr. L. Fraser, Dr. H. Gibson, Dr. N. Kemp, Dr. A. Maclaren, Dr. L. Mill, Dr. P. M. Platt, Dr. Ross, Dr. Shirlaw, Dr. Urwick, and Dr. E. M. Walker, York.

At the same time as the ceremonial was taking place in York, similar services were being held in Canada, South Africa, South and West Australia, Tasmania, and New Zealand.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The thirty-third meeting of the Commission was held in Edinburgh on June 23rd, Prof. Alexander Gray in the chair. Evidence on the question of the supply of medicines and drugs in Scotland under the Insurance Scheme was given by Mr. Rutherford Hill on behalf of the General Council of Panel Chemists of Scotland. The National Farmers Union of Scotland, represented by Mr. J. C. Henderson, submitted evidence as to the position of agricultural societies in the scheme and the need for reducing the rate of contribution for agricultural workers in view of their higher standard of health. Dr. A. Asher, of Thurso, gave evidence on various aspects of the medical service under the Act in rural areas. The thirty-fourth meeting was held at the Home Office, Whitehall, on June 25th, Lord Lawrence of Kingsgate in the chair. Evidence was submitted on behalf of the Queen Victoria's Jubilee Institute for Nurses by Miss Peterkin, Mrs. Bruce Richmond, and Major H. F. Cadell; the College of Nursing by Miss Watt, Miss Viney, and Miss Bremner; the Incorporated Midwives Institute by Miss Doubleday and Miss Gilligan; and the Scottish Midwives Association by Miss Barker. Thereafter Mr. J. L. Cohen, of the Department of Economics, Cambridge University, gave evidence on the structure of the Insurance Scheme and the need for fundamental alterations in certain directions.

Public Health Services.

THE HEALTH OF LONDON IN 1924.

Sir William Hamer, medical officer of health and school medical officer to the London County Council, estimates the mid-year civilian population of the County of London in 1924 as 4,576,505, and there were in addition 9495 non-civilian residents. The marriage-rate was 17.2, about the same as in the previous year. The birth-rate was 18.6, as compared with 20.1 in 1923 and 20.9 in 1922. A diagram shows that while the birth-rate has been halved since 1870, the marriage-rate has remained practically stationary. Thus the birth-rate for 1871-75 was 35.3 and the rate for 1921-25 was 20.0. During the same quinquennia the marriage-rates were 19.6 and 18.0 respectively. The regularity of the diagram is broken by the increase in the marriage-rate caused by the war marriages and a temporary subsequent increase in the birth-rate.

The death-rate was 12.2, as compared with 11.4 in the previous year. The increase is chiefly due to the increased fatality of measles among children under 5 years of age, and the greater number of deaths at ages over 45 due to the greater prevalence of influenza. Encephalitis lethargica caused a considerable number of deaths. The cancer and phthisis deaths increased somewhat, while a decrease occurred in the mortality from diarrhoea and enteritis. A table is given showing the death-rates for the county and the 29 metropolitan boroughs. The infant mortality for London was 69.0; the typhoid fever-rate 0.01; the phthisis-rate 0.98; and the cancer-rate 1.42. Turning to the metropolitan boroughs and excluding the small resident population of the City (13,621), the highest birth-rates were found in Shoreditch (25.0) and Bermondsey (24.3); the lowest in Westminster (11.2), Holborn (13.4), and Hampstead (13.5). The lowest death-rates from all causes occurred in Lewisham (10.4), Woolwich (11.0), Wandsworth (11.1) and Fulham (11.1); while the highest were 14.3 in Finsbury and 14.1 in Southwark. The best infant mortality-rates were in Lewisham (48), Hampstead (56), Stoke Newington (56), Wandsworth (57), and Hackney (59). Bethnal Green had a typhoid-rate of 0.10, the only other boroughs which reached 0.03 being Hampstead and Deptford. The highest rates from phthisis were 1.4 in Southwark, 1.24 in Chelsea, 1.23 in Finsbury, and 1.22 in Woolwich; the lowest being 0.66 in Hampstead, 0.68 in Kensington, 0.7 in Stoke Newington, 0.72 in Lewisham, and 0.73 in Wandsworth. The highest cancer-rates were 1.83 in St. Marylebone and 1.72 in Hampstead; the lowest being 1.0 in Paddington and 1.02 in Bethnal Green. Deaths caused by vehicles and horses show an increase. In London there were 593, 166 being children under 15. Taking for comparison Great Britain as a whole, motor vehicles caused more than eight deaths per day in 1924, being an increase of 24 per cent. on 1923. In the United States during 1924 motor vehicles caused 52 deaths per day, being an increase of 4 per cent. on the 1923 figure.

The condition of Europe as regards small-pox was more favourable than recently, but the presence in the North and Midlands of a mild form of small-pox was a continual menace to London. Prompt and correct diagnosis and efficient administration, in the absence of full protection by vaccination and revaccination, are the chief measures by which London is protected. The County Council places at the disposal of medical officers of health and medical practitioners in London and certain neighbouring areas the services of its expert medical staff for assistance in diagnosis, and co-operates with all the sanitary and port authorities in the country. A history is given of the five cases of small-pox which occurred in London during 1924 and of the four persons, who sojourned in London, en route for other destinations, and were attacked by small-pox after leaving.

In London the death-rate from diphtheria and scarlet fever was practically stationary, while in New York diphtheria showed a small increase on the comparatively low rate for 1923. Sir William Hamer has previously shown that from 1859 to the end of the nineteenth century New York had a far heavier death-rate from diphtheria than England and Wales or London, and suggested that in New York City, before it was extended, diphtheria deaths frequently included scarlet fever and other forms of throat inflammation. This view is confirmed by a diagram showing the similar behaviour of diphtheria and scarlet fever mortality, when taken together, in New York and London from 1866 to 1924. Except for the period from 1870 to 1890 the mortality curve of the two cities from these two diseases is very much alike. Another interesting diagram dealing with the diphtheria record of 24 towns in this country shows the remarkable way in which diphtheria gradually spreads from one part of this country to another. "The impression left on the mind," says Sir William Hamer, "is one of an eminently infectious disease, but of one which spreads quite slowly from one area, town, or country to another, so that whereas in a period of four, five, or more years a continent or large area may suffer severely, the extent to which portions of such continent or other large area are involved varies greatly within the series of years under review." The outstanding fact is that widespread epidemics of throat disease have shown a tendency to occur in Europe and America at recurring intervals of some 20 to 30 years. It has also been noted that epidemics of influenza influence throat epidemics.

There were six cases of human anthrax reported during the year, one of which proved fatal. In four cases the employment of the patients involved handling imported hides; the fifth case was a girl of 10, whose father and brothers handled hides, and the sixth case was thought to have contracted it from a shaving-brush. Notified cases of encephalitis lethargica numbered 605. In 64 cases the diagnosis was revised, reducing the number to 541, with 122 deaths and a case fatality of 45.9 per cent. The prevalence of the disease was most marked in April and May. Sir William Hamer considers in detail the relationship between influenza and cerebro-spinal fever, poliomyelitis and polio-encephalitis, and encephalitis lethargica. The pandemic of influenza in 1918 was preceded by unusual prevalence of cerebro-spinal fever in 1915, and of poliomyelitis in 1916, and was succeeded by the encephalitis prevalences of 1921 and 1924. After discussing the matter at length, Sir William Hamer inclines "to accept the conclusion that the whole group of epidemic diseases primarily affecting the nervous system exhibits a close family likeness (epidemiologically speaking) and a very close relationship, too, with influenza."

After full consideration of the circumstances of the Bethnal Green prevalence of typhoid fever during 1924, Sir William Hamer thinks that the various facts elucidated point very suggestively to small plaice or dabs as the source of infection. "Prior to 1906 these fish, he says, were widely implicated on several occasions in London. This cause, however, ceased to operate in 1909 and (with an exception in 1911) remained conspicuous by absence until after the war. It is suggested that this source of danger, judging from London experiences in the autumns of 1923 and 1924, has recurred and that a close watch should be kept.

The need for removing conditions likely to cause patients to discontinue attendance at the venereal disease clinics is receiving careful attention, and the fact that during 1924 the ratio of attendances to venereal cases was in the proportion of 32 to each new case is valuable evidence of improvement in methods. Such a ratio has never been greater in countries where compulsory notification has been adopted.

The Public Health Committee is investigating the possibility of arranging for a large scale test of

artificial light treatment under satisfactory conditions, in association with the Education Committee and in consultation with the Ministry of Health.

SCHOOL REPORT.

The school report contains several cheering items. For example, the children classed as below the normal in nutrition numbered 6.2 per cent., as compared with 12.8 per cent. in the year before the war. Had it not been for the vigilance of the head teachers and the school care committee in bringing into timely operation the remedial agencies, which now exist to an extent undreamt of before the war, the prolonged period of unemployment must have produced disastrous results. Again the percentage of verminous conditions found was 16.1, the lowest yet recorded, and the number of cases of scabies treated was the lowest since 1914. The devoted work of the *school nursing* staff, supported by the influence of the head teachers, has "literally revolutionised the standard of personal cleanliness attained by elementary school-children in London." In 1923 the proportion of older girls with hair completely free from vermin reached 80 per cent. for the first time. In 1924 the figure was 82.5 per cent. In 1902, when the work began, "the conditions found were indescribable," but in 1913 the free-from-vermin figure had only reached 67.2 for the older girls. Conditions as regards teeth have improved greatly, but "there still remains a very serious amount of dental decay."

Visual acuity also shows improvement. In 1913 the percentage of children aged 12 with vision 6/12 or worse was boys 22.7, girls 25.7. For 1924 the figures were boys 20.1, girls 21.6. The difference between the two sexes, which Sir William Hamer attributes to the employment of girls in indoor occupations involving eyestrain, has thus been reduced from 3 to 1.5. The Jewish schools show an abnormally heavy incidence of visual defects, and in this case the boys come out worse than the girls, and this is attributed to the effect upon the boys of long hours spent in the evenings studying Hebrew.

There were a number of *special inquiries* made during 1924. One was made at the request of Sir George Newman with regard to the signs and effects of congenital syphilis. Dr. Nairn Dobbie investigated the past history of children with heart disease in order to ascertain the early signs of cardiac implication. Dr. Elizabeth M. McVail followed up the school history of premature infants, and found that if such babies survived to school age there was no very great deviation from the normal in general physique. Dr. Percy Stocks made investigations on blood pressure, and found that up to 11 years the mean systolic pressure rises uniformly, that during adolescence the gradient is temporarily increased and reaches a uniform level at the eighteenth year, showing no further rise up to the age of 35 or 40; and that the diastolic pressure rises uniformly until adolescence, more slowly up to 17, then rapidly to 20, after which it falls slightly to 35. Dr. Stocks's investigations do not support the commonly accepted rule that blood pressure rises uniformly throughout life.

An inquiry with regard to the results of operations on tonsils and adenoids supports the view that complete removal of the tonsillar tissue is desirable. The result of the first and second reinspections of children found with defects showed that 75.5 per cent. of such children had been satisfactorily treated. Dental cases present the greatest difficulty, and apart from dental cases 82 per cent. of the ailments were remedied. Convalescent camp schools and arrangements for sending debilitated children to convalescent homes for short periods did good work. The camp school at Bushey Park dealt with 16,296 boys between June, 1919, and December, 1924. It is hoped shortly to establish new open-air schools on Brixton Hill and near Ken Wood. Open-air classes were held in connexion with 95 ordinary elementary schools as compared with 89 in 1923. Attention to physical education is "decidedly on the up grade." Over

11,000 girls were taught to swim during the year and 2875 life-saving certificates were gained. Net-ball is the chief organised game played by the girls. Health classes with special exercises for round shoulders, lateral curvature, lordosis, and flat-foot give good results, and were in operation at 41 schools at the end of the year. Dr. F. C. Shrubbsall has specially investigated the effects of encephalitis lethargica and also supplies a report on the mental examination of delinquent children, which includes inquiries made with regard to this subject in the Canadian provinces and the Northern United States.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 20TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 89; scarlet fever, 1310; diphtheria, 830; enteric fever, 58; pneumonia, 821; puerperal fever, 41; cerebro-spinal fever, 9; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 61; dysentery, 3; ophthalmia neonatorum, 104. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 3 deaths from enteric fever, 62 from measles, 12 from scarlet fever, 62 from whooping-cough, 21 from diphtheria, and 32 from influenza. In London itself the deaths from influenza numbered 8, from whooping-cough 11, and from diphtheria 4.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. H. Lightfoot is placed on the Retd. List with the rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Capt. J. A. Cowan retires, receiving a gratuity.

TERRITORIAL ARMY.

Lt.-Col. W. Bowater to be Bt.-Col.

Maj. H. F. Humphreys to be Lt.-Col. and to comd. the 143rd (South Midland) Field Ambulance, vice Bt.-Col. W. Bowater.

Capt. F. M. Halley is restd. to the establt.

Lt.-Col. (Brevet Col.) D. J. Graham is retired on completion of tenure of comd. and retains his rank.

Maj. D. M. C. Church (I.M.S. ret.) to be Maj.

Capt. R. F. Linton resigns his commn. and retains the rank of Capt.

Capt. G. S. Lewis (late R.A.M.C., S.R.) to be Capt.

A. O. Bekenn and G. W. Robinson to be Lts.

Supernumerary for Service with O.T.C.—Capt. R. B. Green (late R.A.M.C., S.R.) to be Capt., and J. Whillis to be Lt., both for service with the medical unit, Durham University, O.T.C.

INDIA AND THE INDIAN MEDICAL SERVICE.

Lt. C. R. Henderson to be Capt.

The King has approved the retirement of Col. P. Dee and Lt.-Cols. R. Bryson (on account of ill-health) and A. M. Fleming.

Aziz Khan Mahomed Khan and Ganeshrao Venkatrao Gollerkeri to be Temp. Lts.

Capt. J. M. R. Hennessy has been succeeded as Superintendent of the Borstal Institution at Lahore by Capt. N. Briggs; Maj. Thomas acts as Civil Surgeon, Poona, and Maj. B. F. Eminson acts as Civil Surgeon, Karachi. Maj. W. A. Mearns, Officiating Director of Public Health, United Provinces, has been appointed a member of the State Board of Medical Examinations, United Provinces, vice Lt.-Col. C. L. Dunn, resigned. Rai Bahadur Dr. D. D. Pandya, Assistant Director of Public Health, in charge Provincial Hygiene Institute, Lucknow, is continued in his appointment as a member of the State Board of Medical Examinations. Lt.-Col. W. D. Richie has been placed on special duty in Assam; Lt.-Col. G. Tate has been appointed Professor of Midwifery, King Edward Medical College, Lahore; and Mr. H. A. Taylor acts as Lecturer on Dental Surgery, Medical College, Calcutta, vice Mr. J. E. Gill.

Leave has been granted to the following officers: Lt.-Col. G. W. Maconachie, Superintendent of Prisons, Madras; Col. Bakle, Inspector-General of Civil Hospitals; Maj.

St. J. E. Handricks, civil surgeon and superintendent, District Jail, Bhandara; Maj.-Gen. Robinson, Director of Medical Services in India; Lt.-Col. Mackie, director, Bombay Bacteriological Laboratory; Maj. H. W. Acton, professor of pathology and bacteriology, School of Tropical Medicine and Hygiene, Calcutta; Capt. W. A. C. Netscher, medical officer, Eastern Bengal Railway, Kanchrapara; R. E. Murray, civil surgeon, Shahpur; Lt.-Col. Murphy, director of public health, Bombay; Lt.-Col. Davenport Jones, civil surgeon, Karachi; and Lt.-Col. Steel, civil surgeon, Poona.

DEATHS IN THE SERVICES.

Major-General Sir Henry Neville Thompson, K.C.M.G., C.B., D.S.O., late R.A.M.C., died on June 21st at Osborne aged 64. The son of the Rev. M. N. Thompson, rector of Clonmany, Donegal, he graduated in arts and medicine at Trinity College, Dublin, in 1883, entered the Army Medical Service in the following year, and reached the rank of surgeon-major in 1896. In 1898 he became major, R.A.M.C., lieutenant-colonel in 1904, and colonel in 1913. He served in the Nile Expedition of 1898 (medal and Khedive's medal); in the South African War, 1900-02 (mentioned in despatches, Queen's medal with five clasps, and the King's medal with two clasps, and D.S.O.). In the late war he was A.D.M.S., 2nd and 48th Divisions; D.D.M.S., VI. Corps; and D.M.S., First Army and British Army of the Rhine (mentioned in despatches seven times, and received the K.C.M.G. and C.B.). Additional honours included the decoration of the French Croix de Guerre and the American Distinguished Service Medal. He was also a Grand Officer of the Portuguese Order of St. Aviz, and held the Coronation and Delhi Durbar Medals and the King George Coronation Medal.

Correspondence.

"Audi alteram partem."

THE PROBLEM OF MALIGNANCY.

To the Editor of THE LANCET.

SIR,—Dr. A. E. Barclay's important suggestion regarding what he calls the existence of an x factor in malignant disease is of deep interest to us as we have been working for some years on this matter. Our results up to date are embodied in a recently published book.¹ It will be sufficient here to say that we believe—on what we think to be strong evidence—that chronic intestinal infections and consequent toxæmia from organisms of the non-lactose-fermenting type play a most significant part in the causation of cancer. We do not doubt there are other factors—diet, for example, influences these infections in a very marked manner, but toxæmias are of primary importance; correspondingly vaccines given at suitable intervals (long pauses being needed between doses) bring about marked effect in a large percentage of cases of malignant disease.

We are, Sir, yours faithfully,

EDWARD BACH.

June 26th, 1925.

CHARLES E. WHEELER.

To the Editor of THE LANCET.

SIR,—Dr. A. C. Jordan, in his kindly comment on my paper, is apparently in entire agreement with me, but would have me go further. The unknown x that I postulate he would have me name as "the toxæmia of stasis." This, however, is going a great deal further than my own observations would in any sense justify. X may possibly be a toxæmia, but if it is intestinal in origin, surely the removal of the faulty intestine, together with the complete removal of the growth, must inevitably cure the patient. So far as I am aware, there is no evidence pointing in this direction.

To attribute all and every disease to intestinal stasis and to label as "stasis" conditions in the bowels which are compatible with healthy longevity, is, to my mind, unscientific. Because they see what appears to be delay, according to their ideas as to what should happen, the stasis school would have us

at once label this supposedly pathological delay as the cause of all our ills, whether it be cancer or bad teeth. Surely it is more likely that our structure is so ordered as to tolerate these terrible "cesspool" conditions, and that they may actually serve a useful function in the economics of life. The human frame is not made to standard, and what is one man's meat is another man's poison. So also what is stasis in one man is normal function in another. Where one man suffers from depression and headaches, and is thoroughly tired of the world if he does not have a daily evacuation, another suffers from other ills if he attempts to worry his intestines into a daily habit when his natural cycle would be an evacuation every two or perhaps three days. To see robust health and the apple face of perfect health in a woman whose habit is, and always has been, a motion once every three weeks or month should surely cause the most ardent stasis enthusiasts to call a halt.

What we need is some idea as to the possible normal variations as regards the passage of the intestinal contents. So far neither Dr. Jordan nor any of the "stasis school" have convinced me of the soundness of their premises, and I am a long way from identifying my hypothetical x , the underlying cause of cancerous growth, with the much abused "toxæmia of stasis."—I am, Sir, yours faithfully,

Manchester, June 26th, 1925.

A. E. BARCLAY.

THE TREATMENT OF PERFORATED GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—Statements have been recently made that the operation for closure of a perforation effects permanent cure of the ulcer. My personal experience does not endorse this teaching. I have seen cases in which the symptoms of ulceration afterwards became as accentuated as before, and in which posterior gastro-jejunostomy without loop and without clamps followed by rest cured the patients. And during the 28 years which I have exclusively practised this method (with catgut suture of mucous coat and silk of serous) I have not seen a case of peptic ulcer follow.

My plan in cases of acute perforation is to open the abdomen as quickly as possible, involute the opening by interrupted silk Lembert sutures, and fix a patch of omentum over same. Having completed the toilet, the parietal wound is united by interrupted through-and-through double silkworm-gut sutures, leaving space at upper angle for passage of a wisp of silkworm-gut. This drain is not removed before the fifth day. The patient is then kept at rest in bed for one month on milk with the addition of glucose, whisky, or brandy to taste. After a few days' trial of additions, preference is generally expressed for the milk which is always diluted with citrate or other water. Posterior gastro-jejunostomy is then performed and similar rest and diet continued for another month, at the end of which a month of milk pap, glucose, and egg nog dietary begins.

Before discharge the patient's menu for the ensuing year is mapped out, with rider to cleanse his teeth morning and evening with a soft brush and soda or plain water, to eat meat cooked to a turn, to eschew bread and other carbohydrates in quantity, to follow the good example of all reasonable animals by resting for at least half an hour after the midday meal, to limit fruit-eating to early breakfast, and to take at lunch and dinner his coefficient of whatever alcoholic beverage suits him best. To which is added: avoid alcohol between meals, do not smoke before lunch, and do not be tempted to imbibe milk or tea with a meat meal.

If some such plan of post-operative rest and dietary were generally adopted we should hear more of the virtue of gastro-jejunostomy and less about that of gastrectomy. The cells have got to do the healing, and given the general feeble power of resistance which exists in everyone who develops a chronic

¹ Chronic Disease: a Working Hypothesis. London: H. K. Lewis. 7s. 6d.

ulcer of stomach, there is no reason to assume that the chances of cure will be enhanced by the substitution of a large acute wound for a small chronic one. The employment of the cautery for removal of benign ulcers of stomach is not in harmony with the natural laws which favour prompt restitution of normal tissue.

To all about to undertake gastric surgery I commend the careful study of two illuminating contributions to surgical science: Hilton's "Rest and Pain," and Paterson's "The Lure of the New."

I am, Sir, yours faithfully,

Buenos Aires, May 10th, 1925.

JOHN O'CONOR.

THE ALLEVIATION OF CHRONIC PROGRESSIVE DEAFNESS.

To the Editor of THE LANCET.

SIR,—We have every reason to be grateful to Mr. George C. Cathcart for calling attention to a form of treatment which deserves much more serious consideration than it has received up to the present. After three years' experience I can fully endorse Mr. Cathcart's favourable view. My results are particularly gratifying in children, in those cases where the middle-ear deafness has not been relieved by the removal of tonsils and adenoids, or by a subsequent course of inflation.

I also should be glad to know more on the subject of the pathological explanation of the improvement in the old-standing cases, as has been mentioned by previous correspondents. The inventor of the apparatus, Mr. Zund-Burguet, himself believes that actual circulatory and nutritive changes occur in the middle-ear structures and cochlea as the result of the intense physiological stimulation. Some change at the peripheral end-organ is likely, as otherwise it is impossible to explain why tinnitus and vertigo disappear. But perhaps the change may be more central, in the nerve paths and synapses linking up the auditory nucleus with the centres in the temporal lobes. These may have been disused for years and are reawakened to function, in which case a true re-education occurs. The improvement could then be explained on the same lines as the improvement in one or both ears which patients very occasionally experience as the result of using the head-phones of the wireless.

I am, Sir, yours faithfully,

Leicester, June 27th, 1925.

JOHN A. KEEN.

Obituary.

HENRY GRÆME ANDERSON, M.B.E.,
M.D. GLASG., F.R.C.S. ENG.

THE sudden death of Mr. H. Græme Anderson, surgical consultant to the Royal Air Force, from angina pectoris on June 28th last removes a capable surgeon from the medical world of London at the early age of 43. Mr. Anderson received his medical education at the University of Glasgow, and in London at King's College and the London Hospital. He graduated M.B., Ch.B. Glasg. in 1904 and five years later obtained the Fellowship of the Royal College of Surgeons of England. In 1919 he gained the M.D. Glasg. with commendation. After graduation Mr. Anderson held hospital appointments for nearly five years, two of which were spent as surgical registrar and pathologist at the Metropolitan Hospital, followed by two years in a similar capacity at St. Mark's Hospital for Cancer and Diseases of the Rectum. At the time of his death he was surgeon to St. Mark's Hospital, senior assistant surgeon to the Belgrave Hospital for Children, and surgical specialist to the Ministry of Pensions. In August, 1914, he joined the Royal Navy

as a surgeon lieutenant and was attached as surgeon to the original R.N. Air Service expedition, and was subsequently transferred as major to the Royal Air Force Medical Service. He was appointed surgeon to the British Flying School at Vendôme, France, in 1917, and in 1918-19 was surgeon to the Central R.A.F. Hospital.

Becoming associated with the Royal Naval Air Service early in his period of war service he set about studying the various medical problems of flying with skill and enthusiasm—himself taking a pilot's certificate. Naturally the surgical side claimed his particular attention, although he by no means confined his interests to this, but studied generally the best means of effective selection and care of pilots in the widest sense. In addition to various papers he subsequently embodied his experiences in a valuable book on the "Medical and Surgical Aspects of Aviation" (Oxford Med. Publications, 1919). After the war he resumed practice in Harley-street, but remained surgical consultant to the Royal Air Force, and of him in this capacity Group-Capt. Martin Flack, the Director of Medical Research (R.A.F.), writes: "His services proved of the very greatest value, not only on account of his all-round skill as a surgeon, but on account of the fact that, owing to his intimate acquaintance with aeronautics, he was able also to assess the effect upon flying of various disabilities from the psychological and aeronautical points of view. By his charming personality he earned himself a special place in the affection of his colleagues of the Royal Air Force Medical Service; by his skill he earned the gratitude of his many patients in that service. His early death is a blow to all who were connected with him in these duties, and it can be truly said that he leaves a place which it will be very difficult to fill."

Mr. Anderson, in addition to his work in aviation, made many important contributions to surgical literature dealing with diseases of the rectum. In Burghard's "System of Operative Surgery" he wrote the article on Combined Operations for Excision of the Rectum, and in the "Encyclopædia of Medicine and Surgery for Practitioners," the section on the Rectum. Several papers in the medical journals deal with the treatment of hæmorrhoids.

Mr. J. P. Lockhart-Mummery writes: "Henry Græme Anderson's sudden death is a great blow to all who knew him. He was just at the age when he was coming into the fulfilment of his ambitions, and the results of his many years of hard work were beginning to earn their own reward in steadily increasing practice and reputation. Mr. Anderson was a colleague of mine at St. Mark's Hospital for so long that it is difficult to realise that his ready help and sympathy are no longer available. He was a keen sportsman, and was particularly interested in boxing. There have been few boxing matches of importance in London in recent years at which he was not to be seen at the ring side. He was one of the founders of the Proctological Section of the Royal Society of Medicine, and modern rectal surgery owes very much to Mr. Anderson for the advances of the last ten years.

Mr. Anderson is survived by his widow and a daughter.

WILLIAM JAMES JOHNSTONE STEWART,
M.D. EDIN., D.P.H. CAMB.

WE regret to record the death of Dr. W. J. J. Stewart, medical superintendent of the Willesden Municipal Hospital. Dr. Stewart had been in poor health for some time, and his final illness was the result of influenza contracted early this year.

Born in 1868, he studied medicine at the University of Edinburgh and King's College, London, graduating M.B., C.M. Edin. in 1891. Four years later he obtained the D.P.H. Camb., and, in 1896, the M.D. Edin. He devoted his life to the study of infectious diseases and the administration of isolation hospitals, and he

was recognised as one of the first authorities on these subjects in the country. During the war he was chosen by the War Office to take charge of the Addington Park War Hospital for soldiers suffering from infectious diseases. He built up and administered this large hospital in a manner which gave the highest satisfaction to both the military and civil authorities concerned. Dr. Stewart had been in the service of the Willesden Council for the past 22 years, and during his period of office the hospital came to be regarded by the public and by the council as one of the best of the municipal institutions of Willesden.

Dr. G. F. Buchan writes of him: "Dr. Stewart's loss will be felt keenly by all his colleagues, for he was a genial man with a kindly heart and ever ready to exert himself and take any amount of trouble to help his juniors and further their interests. Dr. Stewart was one of the many silent workers in the municipal service whose works are more the subject of criticism than of praise, but who nevertheless at all times and in all circumstances perform their duties with a singleness of purpose and conscientiousness which is characteristic of the official life of this country."

Dr. Stewart leaves a widow, to whom we extend our sympathy.

HAMILTON DRUMMOND, M.B., B.S. DURH.,
F.R.C.S. EDIN.

It is with sincere regret that we record the tragic death, at the age of 41, of Mr. Hamilton Drummond, who was one of the best-known surgeons in Newcastle-on-Tyne. Mr. Drummond was the victim of a fatal accident on June 27th, while motoring to Newcastle from Fourstones, where he was serving in his capacity of Major, R.A.M.C.T., at the summer camp of the Northumberland Hussars. It is presumed that his car swerved and so overturned, whereby he sustained a fractured leg and other injuries, and died six hours after the accident. Mr. Drummond was a son of Sir David Drummond, C.B.E., M.D., Pro-Vice-Chancellor of Durham University, and President of the University of Durham College of Medicine. He studied medicine at the Newcastle-on-Tyne School of Medicine and at the London Hospital, graduating M.B., B.S. Durh. in 1906. In 1912 he became a Fellow of the Royal College of Surgeons of Edinburgh. Before taking up practice as a surgeon in Newcastle Mr. Drummond held in succession several valuable house surgeonships, and was a demonstrator of anatomy in University College of Medicine of Durham. From surgical registrar at the Royal Victoria Hospital, Newcastle, he became assistant surgeon to that hospital, and at the time of his death was consulting surgeon to the Jubilee Infirmary, North Shields, the Haltwistle War Memorial Hospital, and the Princess Mary Maternity Hospital, Newcastle.

Mr. Drummond made many contributions to surgical literature, particularly on conditions of the lower bowel.

THE LATE DR. J. L. DALBY.—Dr. John Lyttleton Dalby, who died at Hove on June 23rd, had practised for a number of years in Brighton and Hove, where he was held in general esteem. He was still in the prime of life, his death following an urgent operation. He was the only son of the late Major Dalby, of Ealing, and studied medicine at St. Bartholomew's Hospital, becoming a licentiate of the Royal College of Physicians in 1894 and M.R.C.S. in the same year.

HOSPITAL COOKING BY ELECTRICITY. — A new electrical cooking equipment has just come into operation at the Bucks County Mental Hospital at Stone, near Aylesbury, and it is claimed that this is the first asylum to make this departure. Considerable economies are looked for in consequence, and it is said that 17 per cent. of the shrinkage in meat in the course of cooking will be saved. There are over 800 patients, but the equipment is capable of cooking for 1000.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At the Third Examination for medical and surgical degrees held recently the following candidates were examined and approved in the undermentioned subjects:—

Part I., Surgery, Midwifery, and Gynecology.—A. Barker, W. A. Barnes, I. C. P. Beauchamp, C. B. Buckley, R. C. L'E. Burgess, N. F. C. Burgess, J. W. D. Buttery, G. A. H. Buttle, R. T. Chadwick, J. E. Church, D. R. T. Clendon, A. C. Copley, A. F. D. Darlington, J. H. T. Davies, R. K. Debenham, J. V. Dockray, A. Elliot-Smith, V. H. Ellis, C. A. Francis, J. H. Francis, J. A. Galletly, S. E. Gawthrop, J. H. Gibbons, N. M. Goodman, H. W. Gordon, J. L. Groom, K. H. A. Gross, J. H. Hamman, P. M. D'A. Hart, C. H. Hilliard, J. C. Hogg, L. E. Houghton, R. H. Metcalfe, E. F. Malony, J. L. Morgan, H. W. Nicholson, G. F. Oakden, L. V. Pearson, C. P. Pinckney, K. G. Salmon, D. G. Shields, A. Simpson-Smith, H. B. Stallard, R. S. Tooth, K. H. Uttley, and H. M. Woodman.

Part II., Principles and Practice of Physic, Pathology, and Pharmacology.—T. F. Anderson, W. A. Bourne, H. F. Brewer, G. A. H. Buttle, W. E. Chiesman, W. R. F. Collis, H. V. Coverdale, J. E. D. Crozier, C. H. C. Dalton, J. H. T. Davies, P. O. Davies, V. W. Dix, J. M. Dobie, H. W. Eddison, J. L. Edwards, A. Elliot-Smith, G. S. W. Evans, K. Fletcher-Barrett, J. H. Francis, P. M. D'A. Hart, N. H. R. Hatfield, R. A. Hickling, J. Holmes, M. C. H. Kingdon, R. L. Lancaster, D. P. Marks, J. P. Marsden, L. P. Marshall, L. M. Maybury, K. F. T. Mills, E. B. Murrell, G. L. F. Rowell, J. Russell Smith, A. J. Smythe, E. W. P. Thomas, S. Vatcher, H. A. Ware, and I. M. Harmer (Girton).

UNIVERSITY OF SHEFFIELD.—At the undermentioned examinations held recently in the Faculty of Medicine the following candidates were successful:—

M.D.—Clara D. Tingle.

Final M.B., Ch.B.—With Honours: John Wilke (with distinction in Surgery and Gynecology). Ordinary: Douglas L. Brown, John S. Calcutt, Ralph K. Dowson, Dorothy L. Gregory, Marion Hirst, Wilfrid Malone, Samuel Newsom, George W. Rippon, and Lucy T. Winkill.

Final L.D.S. Examination (Part I.).—George H. Rayner.

UNIVERSITY OF LONDON.—His Majesty in Council has declared his approval of the amendment of the statute governing the membership of Convocation. Hitherto bachelor graduates have only been able to join Convocation after the expiration of three years from the date of graduation. The attention of Convocation and the Senate was directed to this three years' barrier at the request of the Twentieth Century Society of London Graduates and, under the statute as now amended, all graduates who have attained the age of 21 years are entitled to be registered as members of Convocation.

At a meeting of the Senate of the University of London, held on June 24th, Prof. E. A. Gardner, Litt.D., was re-elected Vice-Chancellor for the year 1925-26. Correspondence has passed between H.M. Treasury and the University on the subject of the Bloomsbury site. The main outcome of the correspondence is that, as the Treasury is not able to hold out any hope that Parliament could be asked to contribute a larger sum than £370,000, representing the commercial value of the site and buildings of King's College in the Strand, the Senate find themselves compelled to decline the offer, made by the Treasury in 1920, which was accepted by the Senate on the condition that terms of removal would be negotiated between the Government, the Council of King's College, and the Senate of the University. The Senate point out that this condition obviously cannot now be fulfilled.—The title of Emeritus Professor of Hygiene and Public Health in the University was conferred on Sir William J. R. Simpson as from the end of the present session on his retirement from King's College, after 27 years' service, on the closing of the department of bacteriology and public health.—The University Studentship in Physiology for 1925-26, of the value of £50 and tenable for one year in a physiological laboratory of the University or of a school of the University, has been awarded to Mr. Isaac Cohen, Ph.D., B.Sc. He proposes to carry out research on tetelin under the direction of Prof. E. C. Dodds at the Bland-Sutton Institute of Pathology at the Middlesex Hospital Medical School.

UNIVERSITY OF PARIS: FACULTY OF MEDICINE.—A post-graduate vacation course in the diseases of children will be held from July 24th to August 14th at the Hôpital des Enfants Malades, 149, Rue de Sévres, Paris, under the direction of Prof. Nobecourt, assisted by Prof. Lereboullet. Lectures and demonstrations will be given twice daily by members of the hospital staff, and an instructional clinic will be conducted each morning by Prof. Nobecourt. The fee for the course is Fr.150. Further information may be obtained from the secretary to the Faculty of Medicine, The University, Paris.

UNIVERSITY OF BRISTOL.—The thesis presented by Francis J. Hector, M.B., Ch.B. Bristol, for the degree of M.D., has been approved by the examiners.

WIRELESS FOR HOSPITALS.—The Wireless for Hospitals Fund, initiated by the proprietors of the *Daily News*, now has between £14,000 and £15,000 in hand, and the advisory council of the fund has decided to equip the largest hospitals first. Twelve of them, beginning with St. Thomas's (630 beds) and ending with the London Temperance (130 beds) are to be supplied as quickly as possible.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE: APPROVED DESIGN.—Mr. P. Morley Horder's design for the new building has been unanimously adopted by the board of management. Competition was limited to five architects who had specialised in the planning and equipment of the type of building required, and Sir Frank Baines, Director of Works at H.M. Office of Works, acted as assessor. Mr. Morley Horder becomes the architect of the building.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The Midland branch of this society proposes to commemorate the knighthood just bestowed upon the medical officer of health for Birmingham by holding a complimentary dinner to Sir John and Lady Robertson at the Queen's Hotel, Birmingham, on Friday, July 10th, at 7 for 7.30 P.M. All members of the Society of Medical Officers of Health are invited to attend this dinner and to bring guests. Early application for tickets (10s. 6d. not including wines) should be made to Dr. R. H. H. Jolly, hon. secretary, Health Offices, Town Hall, Wolverhampton.

STRASBOURG.—A post-graduate course in dermatology and venereology will be held from Sept. 21st to Nov. 7th, under the direction of Prof. L. M. Pautrier, assisted by Profs. A. Barré, L. Blum, G. Canuyt, Merklen, and others. Complete and practical instruction in all aspects of the specialty will be given at the civil hospital and at the various clinics of the town. The fee is Fr.200. Also a course in laboratory methods and in the general pathological anatomy of the dermatoses will be held if sufficient names are received (minimum, five); the fee will be Fr.150. Full particulars may be obtained from Prof. L. M. Pautrier, 2, Quai St. Nicolas, Strasbourg.

MEDICAL RESEARCH COUNCIL: ROCKEFELLER MEDICAL FELLOWSHIPS.—The Medical Research Council announce that they have awarded Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1925-26, to the following: Dr. David Campbell, Pollok lecturer in pharmacology and therapeutics, University of Glasgow; Dr. William H. Craib, M.C., house physician, Guy's Hospital, London; Miss Katherine H. Coward, D.Sc., assistant in biochemistry, University College, London; Dr. William S. Dawson, senior assistant, Maudsley Hospital, London; Dr. Howard W. Florey, John Lucas Walker student, University of Cambridge; Mr. Arthur D. Ritchie, lecturer in physiological chemistry, University of Manchester; and Dr. George P. Wright, Macgregor student and demonstrator in histology, University College, London. Dr. Craib, Dr. Florey, and Mr. Ritchie have been appointed on modified conditions while holding scholarships or emoluments from other sources. Mr. Ritchie's Fellowship is being held during a short period of work in Canada this summer.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On July 9th Mr. G. Grey Turner will lecture on Gall-stone Ileus—a Pitfall for the Practitioner, at 5.30 P.M. in the West Lecture Hall, at 1, Wimpole-street, W. The Prince of Wales's General Hospital (North-East London Post-Graduate College, Tottenham, N.) will hold a vacation course from August 4th to the 15th in medicine, surgery, and the specialties. The mornings will include demonstrations of clinical and laboratory methods, in the afternoons groups of illustrative cases, &c., clinics in the wards and the various out-patient departments. Formal lectures will be given at 4.30 P.M., to which members of the Fellowship of Medicine will be welcomed. Beginning on the same date the All Saints' Hospital will give a month's special course dealing with diseases of the urinary system. Clinical demonstrations will be given and a special lecture each Wednesday afternoon. From August 24th to Sept. 5th the Queen Mary's Hospital, Stratford, have arranged an intensive course in medicine, surgery, and the special departments. A feature of the course is the new department opened for gynaecology and obstetrics. The fee for both intensive courses is £3 3s. each, or £2 2s. for either week, and for the special course in urology £5 5s. Copies of the syllabus of each, together with the Fellowship programme of the general course of instruction available under its scheme, may be obtained from the Secretary at 1, Wimpole-street, W.

WATFORD MEMORIAL HOSPITAL.—Princess Mary last week opened the Watford and District Peace Memorial Hospital of 108 beds, which has been erected at a cost of £66,000.

PRESENTATION OF AN OUT-PATIENTS' DEPARTMENT.—An anonymous Wakefield man, now resident in the United States, has promised to provide a new out-patients' department at the Clayton Hospital, Wakefield. Such a department is urgently needed, the existing one being entirely inadequate; last year there were nearly 40,000 attendances.

STREATFEILD RESEARCH SCHOLARSHIP.—Applications are invited for this scholarship which is awarded for the promotion of research in medicine and surgery by a committee of the Royal College of Physicians of London and of the Royal College of Surgeons of England. The scholarship is worth about £250 per annum, and is tenable for three years. Further directions will be found in our advertisement columns.

THE King has sanctioned the following promotions in and appointments to the Order of the Hospital of St. John of Jerusalem in England:—As *Knights of Grace*: Lieut.-Colonel F. S. Lambert, R.A.M.C. (T.); Major-General Sir Samuel Guise Moores; Dr. Frederick J. Waldo; Captain William Thomas Wood, R.A.M.C.; Dr. Arnold Woodford Izard; and Dr. Donald Moore Barry. As *Esquires*: Dr. John Calderwood Strathearn, Dr. Walter Chaloner Rigby, Dr. John Rodley, and Dr. William Haining Carse.

MANCHESTER INFIRMARY: APPEAL FOR NEW NURSES' HOME.—The Manchester Royal Infirmary has issued an appeal for £150,000 to build and equip a new nurses' home which is urgently required for accommodation of an increased staff. The patients in the Royal Infirmary are well nursed, but at a too great cost to the health of the nurses. The day staff works 63 hours a week and the night staff 73 hours. The following data are given for comparison:—

Hospital.	Hours of work.	
	Day.	Night.
Aberdeen	52	52
Sheffield	56	64
Newcastle	60	69
Manchester	63	73

The board desire to give an all-round working week of 56 hours. The working hours of the maids must also be shortened. In order to do this, 87 additional nurses and 85 additional maids will be required. The nurses, by means of a bazaar, have already raised £5000.

NEW TILBURY HOSPITAL.—Lady Inchcape opened, on June 24th, the new wards of the Tilbury Hospital, erected by the Seamen's Hospital Society on a site rented from the Port of London Authority and within the area of Tilbury Docks. This is an extension of the Passmore Edwards Tilbury District Cottage Hospital founded in 1896, which provides beds not only for seamen, but also for the sick of the surrounding neighbourhood. Of the two new wards, which will accommodate 52 patients, one is for women. Built by Messrs. Mowlem, they were designed by Mr. Stanley Hamp in bungalow style ("not," said Sir Arthur Clarke, the chairman of the society, "that they are a bungle for they are not, but we do owe for them," and, very pertinently, Lady Inchcape thereupon handed to him Lord Inchcape's £500 subscription). The buildings are carried on concrete rafts, and the walls are of hollow triangular cement blocks, hard outside, soft within, securely keyed together. The ceilings are coved and white, but the lower 8 feet of the walls is painted a restful grey which lessens eyestrain. The operating theatre is all white. The floors are also greyish, mottled ("Marvel" flooring), not noisy, of composition similar to the well-known sawdust and gypsum. The bedside lockers are of solid construction and, when turned through a right angle, make steady bed-tables for patients confined to bed. The windows are iron-framed, and in two halves; as the window is opened by the handle, the lower part of the lower half moves outwards and the upper inwards, while the upper sash at the same time moves parallel (lower out, upper in), thus rain is excluded and incoming air directed upwards, so that draughts do not blow on the patients. Angles are all rounded, and the doors are teak, smooth finished to prevent dust lodging; the handles, too, are teak, and the lavatory taps are white-enamelled iron, so there is little to polish anywhere. There is a coal fire in each ward, but otherwise the heating throughout is by radiators, the cooking by gas and steam. In the Nurses' Home each nurse's room has a fixed basin with hot and cold taps over it, and there are sitting and recreation rooms. Two of the beds in the hospital were already endowed, and the chairman was happy in being able to announce that King George's Fund for Seamen would give £1000 to endow another.

THE death of Mr. Thomas Mark Hovell, F.R.C.S. Edin., the well-known laryngologist, at the age of 72 years, is announced as having occurred at Hatfield on June 30th. Mr. Hovell was lecturer on diseases of the throat at the London Hospital and consulting surgeon to the Golden-square Hospital.

THE managers of the Pinsent-Darwin Studentship in Mental Pathology announce that no award has been made this year.

DONATIONS AND BEQUESTS.—Mr. Henry Cornelius Baker, Clifton, Bristol, bequeathed £1000 each to the Bristol Royal Infirmary, the Bristol General Hospital, and Dr. Barnardo's Homes, and £500 each to the Royal Hospital for Women and Children, Bristol, to Müller's Orphanage, and the Bristol Eye Hospital.—During the past month the Royal Manchester Children's Hospital has received subscriptions and donations amounting to £819, including £500 from the Manchester War Memorial Committee.—Sir David Lionel Goldsmid Stern-Salomons, Tunbridge Wells, bequeathed £5000 to Gonville and Caius College, Cambridge, for the fund for increasing the College buildings, and to the Royal Institution some of his scientific apparatus.

ST. BARTHOLOMEW'S HOSPITAL POST-GRADUATE COURSE.—A course of instruction for qualified practitioners will be given at St. Bartholomew's Hospital during the summer vacation from Sept. 7th to 18th inclusive. The object in view is to afford practitioners an opportunity of attending the practice of a large metropolitan hospital and medical college for a short period and of receiving systematic teaching from members of the hospital staff at a time when ordinary lectures and classes for students are in abeyance. A composition fee of ten guineas entitles the practitioner to attend any of the arranged classes as well as the ordinary hospital practice, including wards, out-patients, special departments, operations, and post-mortems. Either of the two weeks may be taken for a fee of six guineas. Application should be made to the Dean, Dr. T. W. Shore, at the Medical College, St. Bartholomew's Hospital, London, E.C.

LANCASHIRE AND CHESHIRE MINERS' CONVALESCENT HOME.—The corner-stones of the convalescent home for the miners of Lancashire and Cheshire, which is to be built at Bispham near Blackpool, was laid on June 26th. The home will be built and equipped out of the Lancashire and Cheshire Welfare Committee's share of the welfare levy of one penny per ton on the coal output for five years, authorised under Section 20 of the Mining Industry Act of 1920. This share on May 31st last, with interest, was £283,406. The estimated cost of the building is about £105,000, and equipment is expected to cost about £20,000. The balance will be invested and the income devoted to the maintenance and upkeep of the home, the site of which is about 7½ acres in extent, facing the sea. The home is planned to accommodate 125 patients, but dormitories for 100 only are at first being provided. Construction was begun in September last and the building is expected to be finished in June next.

"BAY MOUNT," PAIGNTON.—The third annual report gives a clear indication that this comparative newcomer to the ranks of inebriates' homes is rapidly approaching the ideals which have been discussed from time to time in these columns with regard to the treatment of alcohol and drug addicts. The medical superintendent, Dr. Stanford Park, carefully defines what he means by the word "cure"—namely, "that all active craving has been removed and will not come back unless cultivated by the use of alcohol," and then reports that 88 per cent. of those patients classified as curable on admission during the year under review remain cured to date, while 57 per cent. of those classified as incurable have likewise remained free from relapses. It is interesting to note that of the women patients a high proportion of those suffering from alcoholic addiction have undergone some major operation on their reproductive organs. Dr. Park points out with reference to drug addicts that thanks to the Dangerous Drugs Act, patients who are not doctors have little chance of relapsing, and he expresses the hope that as older addicts die off or are cured, drug cases should eventually become extinct.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	..	..	..	£2	2	0
	Six Months	..	..	..	1	1	0
	Three Months	..	..	..	0	10	6
ABROAD	One Year	..	..	..	2	10	0
	Six Months	..	..	..	1	5	0
	Three Months	..	..	..	0	12	6

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Select Committee on Nursing Council Rules.

ON Wednesday, June 24th, a Select Committee of the House of Commons was appointed to consider the rules of the General Nursing Council with regard to the prescribed training for nurses and the reservation of seats on the Council for matrons. The following are the members of the Select Committee: Sir R. Barnett, Sir G. Berry, Mr. R. Davies, Mr. Fisher, Lieut.-Colonel Fremantle, Sir C. Forestier-Walker, Mr. G. Hurst, Sir R. Luce, Colonel Sinclair, Miss Wilkinson, and Mr. R. Wilson.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 24TH.

Institutional Treatment of Sleepy Sickness.

DR. HADEN GUEST asked the Minister of Health whether any special institutional treatment was available for cases of encephalitis lethargica, and whether any special homes are available for cases of children permanently damaged by this disease.—Sir KINGSLEY WOOD replied: My right hon. friend is advised that no special institutional provision is required for cases of this disease in the acute stage, and that such cases may, in general, be properly admitted to isolation hospitals, infirmaries, or general hospitals. As regards the second part of the question, the provision of a special institution for the reception of children suffering from the after-effects of this disease, who cannot be admitted to mental hospitals, is now under consideration.

Proposed Removal of Bethlem Hospital.

DR. HADEN GUEST asked the Minister of Health whether, in view of the proposed removal of Bethlem Hospital from Southwark to a site outside London, he proposed to call a conference of those interested in the matter with a view to the preservation of the site of Bethlem as a permanent open space.—Sir KINGSLEY WOOD replied: Inquiries made by my right hon. friend have not indicated that any useful purpose would be served by calling a conference, but further attempts will be made to see if this matter cannot be settled without pursuing the controversy which has arisen through a Parliamentary Committee.

Yaws in East Africa.

Colonel DAY asked the Secretary of State for the Colonies whether he was aware of any increase in the prevalence of yaws in East Africa; and, as its cure by intramuscular injections of bismuth potassium tartrate was very inexpensive, being approximately one-tenth of a penny per injection, would he take steps to secure the co-operation of those responsible for the government of Kenya and Tanganyika in order that this bismuth preparation might become available in larger quantities.—Mr. AMERY replied: I am not aware of any increase in the prevalence of yaws in East Africa, but it is undoubtedly serious. The remedy mentioned in the question is referred to in the report of the East African Commission, where reference is made to the delay in utilising in Kenya the experience gained in Tanganyika. But the remedy has been in active use in Kenya for at least three years, and I do not think that any special action is necessary.

THURSDAY, JUNE 25TH.

Deaths from Insect Bites.

MR. HERBERT WILLIAMS asked the Minister of Health how many deaths were caused in 1924 in England and Wales by the bites of insects.—Mr. N. CHAMBERLAIN replied: There were 12 deaths in England and Wales in 1924 which were caused, according to medical certificate or coroner's inquisition, by the bite of an insect.

Closing of Broad-street Pensions Clinic.

Captain HUDSON asked the Minister of Pensions if he would explain why disabled men were now being sent for treatment to the clinic at Bulinga-street, Millbank, who previously attended the clinic at Broad-street; and if, owing to the inconvenience which would be caused to the disabled men if the Broad-street clinic was closed, he would try to arrange that it should be kept open and the cases for treatment divided between the Bulinga-street and Broad-street clinics.—Major G. C. TRYON replied: The number of cases requiring only out-patient treatment is in the natural course diminishing, and in consequence, though every effort

is made to meet the convenience of pensioners, the clinic accommodation has necessarily from time to time to be reduced. The Holborn Clinic belongs to the British Red Cross Society and they have intimated that they cannot continue the clinic unless the number of patients is increased. With the general decline in the number of cases this is not possible and consequently the patients have to be diverted to the more permanent clinics of the Ministry—among others that at Bulington-street, where I may say the facilities for all varieties of treatment and the means of access are particularly good.

Excessive Rates of Maternal Mortality.

Mr. GROVES asked the Minister of Health whether he had considered the report of the chief medical adviser for his department for 1924, in which it was stated that excessive rates of maternal mortality were found in the aggregate in most rural areas, such as Breconshire, Westmorland, Montgomeryshire, Radnorshire, and in highly industrial areas engaged in textile manufacture and coal-mining, and especially in such county boroughs as Halifax, Blackpool, Rochdale, Huddersfield, Swansea, Bradford, Bury, Oldham, Dewsbury, and Blackburn; and whether he proposed any special measures to afford the people of these areas additional medical or institutional treatment in order to remedy this state of affairs.—Mr. N. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part the authorities of most of the areas mentioned are already taking steps, as a result of the issue of the circular to which I referred in my reply on May 20th, to provide additional facilities for the antenatal examination and institutional treatment of pregnant women, and the medical officers of my department pay special attention to these points on the occasion of their visits to these areas.

Panel Practitioners and Sight-testing.

Mr. BENNETT asked the Minister of Health whether he had issued an order that in future optical benefits might only be granted on the certificate of the panel practitioner and after sight-testing by a medical man; and, seeing that the general medical practitioner knew little or nothing of sight-testing, would he say whether he had received any representations on the subject from qualified opticians.—Mr. N. CHAMBERLAIN replied: The new model scheme for the provision of ophthalmic benefit by approved societies as an additional benefit contains a provision to the effect that, except in the case of repair or renewal of optical appliances, an applicant for the benefit must have obtained and furnished his society with a written recommendation from a medical practitioner. I have received representations on the subject both from bodies representing opticians and in the opposite sense from representatives of the medical profession, including ophthalmic specialists, and these representations have had due consideration.

Publication of Evidence given to Trevelth Committee.

Mr. BENNETT asked the Minister of Health whether he was aware that Colonel L. W. Harrison, of the Ministry of Health, at the Congress of the Royal Institute of Public Health at Brighton, on May 29th, objected to Mr. H. Wansley Bayly, hon. secretary of the Society for the Prevention of Venereal Disease, quoting from the evidence of witnesses before Lord Trevelth's Committee of Inquiry, on the ground that such evidence was confidential; whether the Ministry of Health had received from the Committee of Inquiry any communication to the effect that the evidence of witnesses before that Committee would be treated as confidential; and, seeing that typewritten copies of evidence were being supplied on application to those who gave it without any stipulation being made that such copies were confidential, would he say what was the reason for the non-publication of the evidence before this Committee.—Mr. N. CHAMBERLAIN replied: The reply to the first part of the question is in the affirmative and to the second part in the negative. I understand that the Committee decided not to ask for the publication of the evidence.

Danger of Insecticides on Apples.

Colonel DAY asked the Minister of Health whether he was aware that Bordeaux mixture (sulphate of copper and lime), containing a proportion of arsenic, was being used as an insecticide on apples; and, as these apples were frequently eaten by children before being cleaned, would he take action to secure the removal of any insecticide deposit before the apples were packed or sold for human consumption.—Mr. N. CHAMBERLAIN replied: Yes, sir. The matter has been under the observation of my department for a number of years, but the quantities of arsenic which had been actually found on apples exposed for sale had been so minute as not to justify the institution of special restrictive measures.

Deaths from Ptomaine Poisoning.

Colonel DAY asked the Minister of Health whether he was aware of any increase in the number of deaths from ptomaine poisoning, following the eating of tinned foods; and whether the recommendations contained in the report of the Committee of Inquiry on Impure Foods were to be carried into effect.—Mr. N. CHAMBERLAIN replied: The number of deaths reported as due to ptomaine poisoning during the five years 1920 to 1924 was 32, 48, 22, 21, and 16 respectively. It is not possible to state in how many of these cases the poisoning was due to the eating of tinned foods, but the numbers can only be a small fraction of the totals already given. A draft of regulations to give effect to the principal recommendations of the Departmental Committee on Preservatives and Colouring Matters in Foods has been published, and I am now considering the form in which the regulations shall be finally made.

Tuberculous Cattle and Sheep.

Lieut.-Colonel HENEAGE asked the Minister of Health what percentage of cattle and sheep were found to be tuberculous when slaughtered for food, giving the percentage separately for bullocks, cows, and heifers.—Mr. N. CHAMBERLAIN replied: I regret that I cannot give the figures for the whole of the country. The figures given by the medical officer of health for the City of London as regards the Aldgate slaughter-houses (figures which are probably somewhat below the average for the whole country) are as follows:

	1923.	1924.
Number of bovine animals slaughtered ..	38,817	40,058
Percentage found to be tuberculous:		
All bovines	0.34	0.45
Bulls	2.40	4.40
Calves	0.94	0.04
Cows	25.45	28.00
Heifers	11.11	3.10
Oxen	1.20	2.00

Tuberculosis is scarcely ever found in sheep slaughtered for food.

MONDAY, JUNE 29TH.

Ambulance Committee's Recommendations.

Dr. LITTLE asked the Minister of Health whether the recommendations of the Ambulance Committee of King Edward's Hospital Fund have received his consideration; and whether he proposed to give effect to them.—Mr. N. CHAMBERLAIN replied: So far as these recommendations can be dealt with by administrative action they have been put into operation. So far as they require legislation I fear that they must await the general measure of Poor-law reform which I have in contemplation.

Health of Gold Coast Miners.

Mr. THURTELL asked the Secretary of State for the Colonies whether he had yet received the report upon the health statistics of the native mine workers in Gold Coast Colony; and whether it was proposed to publish this report.—Mr. AMERY replied: The report has been published on behalf of the Gold Coast Government by the Crown Agents for the Colonies, and copies may be purchased from them. I will place a copy in the library.

Medical Service in African Colonies.

Lieut.-Colonel ANGUS McDONNELL asked the Secretary of State for the Colonies the number of qualified medical officers allowed for in the establishments of the West African Crown Colonies and East African Crown Colonies and Protectorates respectively; whether all the positions were filled; and, if not, what was the number under authorised establishment strength.—Mr. AMERY replied: The estimates for the four West African Colonies provide for a total of 246 qualified medical officers. There are at present 32 vacancies after allowing for selected candidates at present under instruction in tropical medicine. In the East African Medical Service, which includes the medical staff of Kenya, Uganda, Nyasaland, Zanzibar, Somaliland and Tanganyika, the authorised strength is 152. There are seven posts unfilled. The medical department of Northern Rhodesia has an establishment of 13 medical officers, and there is one vacancy at present.

Ambulance and First-aid Work at Wembley.

Colonel DAY asked the Parliamentary Secretary to the Overseas Trade Department how many trained nurses or trained staff, either men or women, were employed at the ambulance stations of the British Empire Exhibition, and what their remuneration was respectively; who was responsible for engaging them; how many voluntary or semi-trained men and women were employed in this ambulance or first-aid work; what was their remuneration or out-of-pocket expenses, and by whom were these amounts paid; and how many hours each respective class was expected to be on duty.—Mr. A. M. SAMUEL, Parliamentary

Secretary to the Overseas Trade Department, replied: I am informed by the British Empire Exhibition authorities that the following trained staff are employed at the ambulance stations of the Exhibition at the rates indicated:—One wardmaster and dispenser at £5 5s. per week; one assistant and dispenser at £4 4s. per week; one matron at £4 4s. per week; and one sister at £3 3s. per week. I understand that the wardmaster and the assistant were engaged by the Exhibition authorities, and the matron and sister by the joint committee of St. John's Ambulance and the British Red Cross Society, and that they work eight hours a day. The following semi-trained voluntary workers are also employed: 12 nurses, 45 orderlies, who are provided by the above-mentioned societies alternately a month at a time. I am informed that they work on five-hour shifts and receive an allowance of 2s. 6d. each per shift for expenses, which is paid by the Exhibition authorities. In addition to the above-mentioned staff there are three qualified medical practitioners.

Local Authorities and House Building.

Mr. RILEY asked the Minister of Health the number of local authorities which have built or are now building houses under the 1924 Housing Act; the number of houses sanctioned under that Act; and the weekly rents charged, exclusive of local rates, for such houses.—Sir KINGSLEY WOOD replied: Four hundred and fifty-nine local authorities in England and Wales have so far received approval to schemes under the Housing (Financial Provisions) Act, 1924, the number of houses authorised being 61,484—59,947 to be erected by the local authorities and 1537 by private enterprise. Of these 4428 had been completed by local authorities and 33 by private enterprise on June 1st; and 15,855 and 184 respectively were under construction at that date. I am advised that in general the rents charged approximate to the rents of houses erected under the Housing, &c., Act, 1923.

Accident in Ammonia Factory.

Miss WILKINSON asked the Home Secretary whether his attention has been drawn to the case of Mr. George Charles Bainbridge, who, as the result of a fall while employed at the works of the Synthetic Ammonia and Nitrates, Limited, of Billingham, was now detained in a mental institution; whether he was aware that no compensation has been paid and that the man was not in receipt of national health insurance; and whether, seeing that the man fell in a doorway near the carbon monoxide plant and that the laboratory at Harrogate, while unable to certify that Bainbridge had been gassed, did contend that he sustained concussion as the result of the fall, he would inquire into this case.—Sir W. JOYNSON-HICKS: I have made inquiries with regard to this case and am informed that after a full hearing the judge accepted the view that the man had been suddenly seized with an acute brain illness which caused him to collapse in the position in which he was found; and decided that his condition was not due to an accident arising out of and in the course of his employment.

TUESDAY, JUNE 30TH.

Ex-Service Men and Tuberculosis.

Brigadier-General BROOKE asked the Minister of Pensions whether he was aware that it was the custom to give ex-Service men whose tuberculosis was admitted as attributable to war service only four weeks' institutional treatment; and, seeing that satisfactory results could not be expected within such a limited period, if he would grant longer periods of treatment.—Lieut.-Colonel G. F. STANLEY replied: My hon. and gallant friend has, I fear, been seriously misinformed. It has been the policy, both of my right hon. friend and of his predecessors, in coöperation with the Ministry of Health, to secure as far as possible preferential treatment for disabled men suffering from tuberculosis due to their war service, and I am glad to say that the average period of in-patient treatment in these cases is not one month, but four months.

SHEFFIELD ROYAL INFIRMARY.—Notwithstanding that 42 new beds have been in daily occupation from the beginning of the year, the waiting-list continues to grow and now numbers 1750. A further 33 beds are being opened immediately.

LEIGH INFIRMARY EXTENSIONS.—The foundation-stones of the Leigh Infirmary extension and the new nurses' home will be laid on July 25th. The total cost for the extensions and for the purchase of additional land, furnishing, and other expenses will be about £30,000. Towards this sum about £23,000 has been collected during the past 18 months. An effort is to be made in the town to raise £7000 in order to open the buildings free from debt.

NATIONAL PHYSICAL LABORATORY: THE ANNUAL INSPECTION.

At the invitation of the President of the Royal Society a large number of people gathered at Teddington on June 23rd for the annual inspection by the General Board of the National Physical Laboratory. This occasion affords to many who are interested in science a valuable opportunity to gain an insight into the work of a great scientific institution. The march of science is so rapid that each year sees the expansion of the laboratory which is so essential if progress is to be maintained. Of outstanding interest in this growth may be mentioned the new high voltage laboratory now under erection, which will house the 1,000,000-volt transformer and thus render possible a study of the problems of high voltage electric transmission for which there is an increasing demand. The erection of an adequate laboratory for the Physics Department, at present distributed in three separate buildings, will begin this year, and marks but another step towards increased efficiency. The visitor this year is struck by the increasing application of X rays for the elucidation of the problems presented by the various materials used in industry and science. The medical profession realised from the moment of their discovery the flood of light X rays could throw upon the internal conditions of the human body, and slowly the rays are being turned on all matter revealing information of far-reaching importance.

An inspection of the Radiology Department of the laboratory shows how varied are the uses to which X rays are put. The structure of several metals and alloys have been studied by the X ray spectrometer. Lane photographs have been taken of diamonds used as pivot bearings with a view to discovering the conditions necessary to good bearing. Examination for flaws in metals and castings is carried out with a high voltage X ray installation, whilst the rapid elimination of soda glass clinical thermometers is effected by subjecting batches of thermometers to a fluoroscopic test. The increasing application of X rays has led to improvements in X ray tubes and in the methods of obtaining the high vacuum necessary to them. In this work of improvement the Radiology Department continues to play its part. Work in high vacuum research is being continued and an all-steel vacuum pump has been evolved which is compact, simple in use, and possesses distinct advantages over the earlier form produced by the laboratory. Experiments with hot cathode metal X ray tubes of high output are in progress. An experimental tube capable of carrying continuously 30 m.a. at 70 kilovolts has been designed. The tube is permanently attached to a vacuum pumping apparatus and means are adopted whereby targets of different metals may be easily fitted to the tube. The rapid simplification of vacuum pumps leads one to think that soon they will be more widely used in conjunction with gas X ray bulbs to maintain a constant gas pressure under running conditions and thus remove the main objection to this type of tube. Researches on the scattering of the gamma rays of radium, which led to important results last year, are being continued, and measurements of the absorption and scattering coefficients of X rays are being made. The Radiology Department is noteworthy for its complete equipment for routine measurements, enabling on the one hand the accurate determination of the radium contents of tubes and applicators, and on the other the investigation of the lead equivalent and homogeneity of X ray protective materials.

The Department of Sound continues to make good progress in the photography of sound by the spark method, and interesting results were shown of the way in which sound is reflected from various types of reflector. The study of the transmission and reflection of sound by partitions is being continued and special chambers have been erected for the work. The ripple-tank method of investigating

features of wave reflection has been considerably improved by providing the lamp illuminating the tank with a revolving shutter, which works in synchrony with the tuning-fork vibrator. The intermittent illumination of the tank results in a fascinating stationary picture of the ripples and enables one to study with ease the refraction of waves passing through different thicknesses of liquid. Considerable improvements have been effected in apparatus used for measuring carbon dioxide in the air of closed spaces such as the holds of ships. Excessive quantities of carbon dioxide have been found harmful to consignments of fruit, and the need for rapid and simple estimation of the gas has been urgent. Several types of dial-recording instruments have been made, which should find a much wider field of service than that for which they were originally designed.

In the *Department of Heat* the number of clinical and precision mercury thermometers tested remains at approximately the same level as in previous years. In parallel with this testing work, research is being carried out in platinum resistance thermometry and a new type of resistance bridge is being used for the purpose, which allows thermometric measurements of the highest precision to be made.

Of the remaining *Departments of Aero-dynamics, Metallurgy, Metrology, Wireless Telegraphy and Electrotechnics*, the last two are perhaps of more immediate medical interest. That arrangements have been made by the Electrical Department for the measurement of direct currents up to 10,000 amperes, and that a 5000-volt direct current set has been installed for the testing of apparatus used in railway equipment is indicative of the wide range of measurement catered for at the laboratory. That the National Physical Laboratory is largely concerned in the pursuit of accuracy is well illustrated in the comparatively new methods for the measurement of radio frequencies, which by the use of quartz resonators give an accuracy of 1 part in 10,000 for a range of wave-lengths from 25,000 to 30,000 metres.

The National Physical Laboratory is to be congratulated upon its record for the past year and upon the high degree of efficiency and accuracy it has attained in all departments. The laboratory is playing a worthy part in the progress of the national industries.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

MONDAY, July 6th, to SATURDAY, July 11th.—WEST LECTURE HALL, Royal Society of Medicine, 1, Wimpole-street. Lecture arranged by the Fellowship of Medicine and open to members of the medical profession. Thursday, July 9th, at 5.30 P.M., Mr. G. Grey Turner: Gallstone Ileus—A Pitfall for the Practitioner.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E.—Special Course in Diseases of Children daily from 10 A.M., morning and afternoon sessions covering demonstrations, ward round, out-patient departments, and operations. (First week.)—ST. PETER'S HOSPITAL, Henrietta-street, W.C. Special Course in Urology. Clinical work every afternoon throughout the week. Lectures: Monday, Mr. J. Alban Andrews: Genito-Urinary Tuberculosis; Tuesday, Mr. Swift Joly: Urinary Calculi; Wednesday, Mr. Clifford Morson: The Technique of Renal Surgery; Thursday, Mr. F. J. F. Barrington: Non-Tuberculous Infections of the Urinary Tract; Friday, Sir John Thomson-Walker: Urinary Obstruction.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

TUESDAY, July 7th.—4.30 P.M., Dr. L. R. Yealand: The Diagnosis and Treatment of Functional Nervous Disease. FRIDAY.—4.30 P.M., Mr. W. Ibbotson: Hoarseness, its Cause and Treatment. Daily.—Clinics in General and Special Departments. Demonstrations, Operations, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 6th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Donald Armour: Operations.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 3 P.M., Mr. Tyrrell Gray: Operations. 3 P.M., Dr. Pritchard: Medical Wards.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Dowling: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Sir Henry Simson: Gynaecological Ward. 12 noon, Surgical Registrar: Surgical Pathology.

FRIDAY.—12 noon, Dr. Pritchard: Modern Methods of Medicine. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept. 4 P.M., Dr. Archer: Bio-chemistry.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

THE LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C. 2.

TUESDAY, July 7th.—5 P.M., Dr. Graham Little, M.P.: Occupational Dermatoses.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Marylebone-road, N.W.

THURSDAY, July 9th.—5 P.M., Mr. Lane Roberts: Clinical Features of Obstructive Labour.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, July 9th.—4 P.M., Dr. Robert Hutchison: Diet after the Period of Infancy.

Appointments.

HODGSON, H. K. GRAHAM, M.B., B.S. Durh., D.M.R.E. Camb., has been appointed Honorary Radiologist, King's College Hospital.

LANE-ROBERTS, C. S., M.S. Lond., F.R.C.S. Eng., Obstetric Surgeon (with charge of out-patients), Royal Northern Hospital, Holloway-road.

MOFFATT, JAMES, M.B., Ch.B. Glasg., Medical Officer of Health to the Durham Rural Council and Medical Officer to the Houghall Isolation Hospital.

ROBINSON, W., M.D., Ch.B. Leeds, Medical Superintendent of the City of London Mental Hospital at Stone, near Dartford.

St. Mary's Hospitals, Manchester: BRIDE, J. W., M.D. Lond. and Manch., Honorary Assistant Surgeon; FERGUSON, R. A., M.B., Ch.B., and JOHNSTONE, MARGUERITE, M.B., Ch.B. Birm., House Surgeons at Whitworth-street West Hospital; SHEEHAN, EILEEN, M.B., Ch.B. Manch., and HUMBLE, GRETA E., M.B., Ch.B., House Surgeons at High-street Hospital.

Salford Royal Hospital: WARBURTON, EDWARD J., M.R.C.S., L.R.C.P. Lond., House Surgeon; ALLAN, MALCOLM, M.B., Ch.B. Glasg., Casualty House Surgeon; MAGEE, ANDREW V., M.B., Ch.B. Glasg., House Physician.

University of Manchester: DIGGLE, F. HOLT, F.R.C.S., and LANGLEY, G. J., M.D. Lond., Hon. Assistant Lecturers in Physiology; BRAMWELL, J. CRIGTON, M.D. Manch., Hon. Assistant Lecturer in Experimental Physiology.

Certifying Surgeons under the Factory and Workshop Acts: SMITH, J. W., M.B., Ch.B. Manch. (Borrowash District, Derby), and DUNCAN, A. G. B., M.D. Aberd. (Kids Grove District, Stafford).

Vacancies.

For further information refer to the advertisement columns.

Birmingham Union, Western-road House and Children's Receiving Homes—Res. M.O. £575.

Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.

Bradford Royal Infirmary.—Res. Surg. O. £250.

Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.

Bury County Borough.—Asst. M.O.H., &c. £600.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Res. M.O. £250. Also H.P. at rate of £200.

Croydon County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £600.

Eastbourne Royal Eye Hospital.—Hon. Ophth. S.

Edinburgh University.—Chair of Public Health. £1000.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. for six months. £50.

Lanark County.—Bacteriologist and Pathologist. £750.

Liverpool, Brownlow Hill Infirmary.—M.O. £600.

- London Hospital Dental School, E.—Asst. Dental Anaesthetists. £25 each.
- London Hospital, E.—Two Hon. Asst. Aural S's. Also First Asst. to one of the five Surg. Firms. £400.
- London Lock Hospital, 283, Harrow-road, W.—Second H.S. £150.
- London School of Hygiene and Tropical Medicine.—Four Research Studentships in the Division of Tropical Medicine and Hygiene. £250.
- Manchester, Ancoats Hospital.—Hon. Radiologist. Also H.S. at rate of £100.
- Manchester, Crossley Maternity Hospital, Ancoats.—Half-time Res. M.O. at rate of £50.
- Manchester, St. John's Hospital for the Ear, St. John-street.—Hon. Asst. S.
- Manor House Hospital, Golder's Green, N.W.—H.S. £200.
- Manfield Borough.—Asst. M.O.H. £600.
- Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—H.S. £150.
- National Hospital for the Paralyzed and Epileptic, Queen-square, W.C.—Asst. P.
- New Zealand Government, Mental Hospitals Dept.—Two Asst. M.O.'s. £615.
- Norwich, Norfolk and Norwich Hospital.—Res. Anæsth. £150.
- Notts Education Committee.—School Dentist. £500.
- Royal College of Physicians, Pall Mall East, S.W.—Streatfeild Research Scholar. £250.
- Royal College of Surgeons of England.—Examiner in Dental Surgery.
- Royal Free Hospital, Gray's Inn-road, W.C.—Obstet. Asst. £50. Obstet. H.S. and Gynaecol. H.S. Also H.P.
- Royal Northern Hospital, Holway, N.—M.O. in charge of Electro-Therapeutic and Massage Dept. 100 guineas. Also S.
- Sheffield University and Jessop Hospital for Women.—Asst. Path. and Demonstrator of Anatomy. £300.
- Staffordshire Education Committee.—Asst. Sch. Med. Inspector. £600.
- Stafford, Staffordshire General Infirmary.—H.P. £150.
- Sudan Government, Wellcome Tropical Research Laboratories, Khartoum.—Asst Bacteriologist. £E. 720.
- Winchester Royal Hampshire County Hospital.—H.P. £150.
- The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Horncastle, Lincs.
- The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Consett and Durham County Courts (Circuit No. 2). Applications should reach the Private Secretary, Home Office, London, S.W., not later than July 18th.

Births, Marriages, and Deaths.

BIRTHS.

- PHILLIPS.—On June 25th, at "Aspland," Norwich, the wife of Captain Phillips, D.S.O., M.C., R.A.M.C., of a daughter.
- POOLE.—On June 19th, at South Wigston, Leicester, the wife of Frank S. Poole, M.R.C.S., L.R.C.P., of a son.
- POWELL.—On June 17th, at Lower Baggot-street, Dublin, the wife of Lieut.-Colonel W. J. Powell, I.M.S., of a daughter.

MARRIAGES.

- COOK—GRIFFITH.—On June 25th, in London, Leslie Colin Cook, M.R.C.S., L.R.C.P., to Barbara, eldest daughter of Lieut.-Colonel E. H. Griffith, C.B.E., of Ennismore-gardens, S.W.
- JEPSON—DEFRIES.—On June 13th, at St. Mary Abbot's, Kensington, Dr. A. C. Jepson, of Bromley, Kent, to Anne Amelia, younger daughter of Mrs. Defries, of Woodlands-avenue, Finchley, N.
- PULFORD—THOMAS.—On June 20th, at the Presbyterian Church, Roath Park, Cardiff, Herbert Pulford, M.A., M.B., B.C. Camb., L.D.S. Eng., to Gertrude Thomas, of Cardiff.

DEATHS.

- ANDERSON.—On June 28th, suddenly, Dr. Harry Graeme Anderson, M.B.E., M.D., F.R.C.S., of Harley-street and Maida-vale.
- DALBY.—On June 23rd, at Brighton, John Lyttleton Dalby, M.R.C.S., L.R.C.P., aged 55.
- LEON.—On June 24th, in London, George Alexander Leon, M.D., aged 68.
- ROE.—On June 23rd, at Liverpool, Lieut.-Colonel W. F. Roe, D.S.O., T.D. (R.A.M.C.T.), aged 54.
- RYAN.—On June 24th, Charles E. Ryan, M.D., F.R.C.S.I., J.P., Glenlara, Tipperary, aged 75.
- STEDMAN.—On June 24th, at Leighton Buzzard, Percy Taylor Humphrey Stedman, M.B. Lond., M.R.C.S., J.P., aged 48.
- N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HOSPITALS AND THE MILK-SUPPLY.*

BY R. VEITCH CLARK, M.B., B.Sc. EDIN., D.P.H.,
MEDICAL OFFICER OF HEALTH TO THE CITY OF MANCHESTER.

THE milk-supply is of special importance in hospital work as it forms the main food of patients in the crucial period of their illness. The three main qualities of a good milk-supply are: (a) the maintenance of a minimum standard of chemical composition—fats, non-fatty solids, &c.; (b) the possession of what are known as the biological properties of milk—i.e., the presence of vitamins, immune bodies, &c.; (c) the maintenance of a satisfactory standard of bacteriological purity.

A great deal of work on the immune bodies conveyed in milk has been done both in human milk and in cow's milk. The immunities possessed by the newly born child are very markedly affected by the milk ingested and adults will unquestionably be similarly affected. There is no doubt that in the fight of the body against illness such properties in the food do at times determine the swing of the balance towards recovery when it would otherwise turn against the patient, with general illness as well as with septic and specifically infectious conditions.

Vitamin Content of Milk.—Bacterial Contamination.

Milk contains all three of the main groups of vitamins. The constitution of these substances is not yet known; they can only be recognised by their absence—i.e., by the consequences of their deficiency in food. It would be unjustified to assume that their action is confined to the one avenue suggested by the specific conditions set up by that deficiency. Indeed, the group of fat-soluble vitamins clearly exert a profound influence on the growth and activity of the whole of the bodily organism.

Milk is one of the best media for the growth of practically all of the well-known bacteria, and the processes involved in its production and distribution for general consumption expose it to a degree of contamination which makes it perhaps the least cleanly food in general use. The infection of milk by the bacteria producing the acute infectious fevers, such as enteric fever, scarlet fever, and diphtheria, results in such large and rapidly spreading outbreaks of these diseases, and the danger to the public welfare is so obvious and now so well recognised, that immediate and energetic measures are always taken to eliminate the infected milk from general use and to discover and remove the source of infection. These infections are not, however, constant in milk; they arise as a direct contamination from human sources which, with modern means of investigation, can practically always be discovered. The regularly occurring bacterial contamination of milk is of much greater significance.

Out of 75 samples taken from the general milk-supply of Manchester during 1922–25 tubercle bacilli were found in 12; but no tubercle was present in any sample of the hospital milk. The actual number of bacteria is very greatly less in the latter than in the former, and this diminution of bacterial content is the more striking in that the hospital milk-supplies all come from considerable distances and there is no ice carriage of any description supplied. The conditions only differ from those of the general milk distribution to the public, in that the milk churns have overlapping lids and are sealed at the farm. Over a period of 23 years the results of the examination for tubercle in milk sent to Manchester reveals an average infection with this condition of 9.48, or nearly 1 in 10 of the milk supplied. The incidence of bovine infection varies considerably according to the site affected in man, but to say that tuberculosis of bovine origin accounts for over 50 per cent. of the non-pulmonary tuberculosis of the country is making an extremely conservative statement. It is much more likely that it will account for at least 70 per cent. of the non-pulmonary type of tuberculosis. In the city of Manchester the annual average of non-pulmonary tuberculous conditions notified in persons under 15 years of age during the last 11 years was 494. There is, therefore, a certainty of at least 250 persons being annually infected with tuberculous milk to such an extent as to produce active disease in Manchester alone. These are the cases that are known to the public health authority, and there is no doubt that a very considerable percentage do not come under observation. A significant point is that owing to the impossibility of proper veterinary supervision of the farms during the war the milk did, in these years, show the occurrence of the infection of tuberculosis. This is clear evidence that adequate supervision of

* Abstract of a paper read at the British Hospitals Association Conference held at Manchester on June 25th, 1925.

farms can eradicate tubercle from the milk-supply. Ordinary careful, skilled supervision can reduce the bacterial contamination of milk a long way towards the standard which has been set by the Ministry of Health in the best of the graded milks established under the Milk (Special Designations) Order, 1923, made under the Milk and Dairies (Amendment) Act, 1922.

The importance of a relatively small bacterial contamination lies in two factors: (1) that bacteriological examination of milk is an extremely exacting gauge of the cleanliness of milk production and milk handling, and (2) that it is an index whereby a reasonable margin of safety can be assured in relation to the incidence of such intestinal diseases as acute or epidemic diarrhoea, and the intestinal troubles which are characteristic of infancy and old age, and the weaknesses of severe illness. That diarrhoea can be controlled by proper handling of milk has been abundantly proved during recent years, more especially in connexion with the remarkable fall in epidemic diarrhoea amongst infants, which is without doubt mainly attributable to the prevention of infection of milks and infant foods, or the measures taken to destroy that infection before such foods are administered to the children.

Over 20 years ago an inquiry was conducted in Yorkshire as to the main source of infection of milk with intestinal organisms, an investigation which was carried out on an extensive scale and with the most meticulous care, and the results showed that the primary and major infection occurred in the cowshed. It is exactly this source of infection that is controlled by the supervision of the source of milk supplied to our hospitals. It is particularly one which can be watched by every hospital authority in the country, and by so doing, and letting it be known generally that it is done, a unique opportunity is afforded to hospital boards of management to act as leaders of thought and action in the public welfare in this matter.

The Hospital Milk-supply in Manchester.

The municipal hospitals of Manchester obtain a satisfactory milk-supply by inserting into the conditions of the contract the following clauses:—

The milk shall contain not less than 3.25 per cent. of fat and 8.75 per cent. of solids (not fat), and be free from the infective matter of tuberculosis.

The milk must be subject to the approval of the Committee, who will return, at the expense of the contractor, any milk found on delivery to be inferior in quality or in any way unsuitable for the purpose intended, and the contractor will be required to supply other milk of approved quality in place thereof. By way of additional precaution the Committee reserve the right, if they are dissatisfied with the milk delivered or offered for delivery, by resolution, absolutely to cancel the contract.

The milk must be placed in cans and sealed by the farmer before being despatched by train, and on arrival at the station the milk must be especially and immediately despatched to the hospitals, and not taken to any intermediate place. The herd and premises must be at all times open to inspection and examination by the Committee's veterinary officer.

The farm from which the milk is supplied must be kept in a sanitary condition as well as the appliances used, and the process adopted in handling the milk must be satisfactory to the corporation.

There has never been at any time difficulty in getting tenders sent in under these specific conditions, and there is always considerable competition. The price paid for the milk is, as a rule, slightly in excess of the ordinary commercial sale price obtained by the farmer, the extra being paid in respect of special services rendered by the farmer in guaranteeing a definite quantity daily, rather than in respect of any particular condition which the contract places upon him in the manner of milk production. There can be little doubt that if the conditions which Manchester imposes with a view to obtaining a really clean and tubercle-free milk were generally practised throughout the country there would not be any genuine grounds for increase on this account in the price of milk supplied to the public in general.

Farm Conditions.

The veterinary services are supplied to the farmers free, the supervision being carried out by the veterinary surgeon on the staff of the public health department specifically in charge of the city's milk-supply. Such a supervision is unquestionably a public health measure and should be available to the farming community throughout the country, just as the services of the preventive medical staff of the country are available to the public in connexion with general infectious disease. This type of work is clearly undertaken in the interests of the nation at large and should be met out of the national and local purse.

The farms to which the contract is given are inspected by the veterinary surgeon once or twice per month. The herds are examined and all the conditions under which the milk is produced are subjected to careful scrutiny. The churns are of an approved type, with overlapping lid, and are periodically inspected for their soundness and they are each sealed with a red seal before being despatched. In

each farm an installation of steam sterilisation for the churn is required. Overalls are worn by the milkers and strict personal cleanliness is required both in the milking and the grooming of the cows. The evening and morning milks must not be mixed. The relationship of the veterinary surgeon to the farmers has always been of an extremely friendly nature and much valuable help and advice is available to the farmer in consequence of this amicable coöperation. Any matters affecting the welfare of the herd, including the feeding, and breeding for increased milk production, have always been an essential part of the work of the veterinary surgeon. In one notable instance the advice as to breeding has resulted in an increase of the yield of milk from about 450 gallons per cow per annum to 700 gallons per cow per annum. No farmer who has had the contract with the hospital has failed to achieve prosperity in his work, the continuous professional advice and help which the farmer has received having reduced sickness amongst the herds.

A valuable aid to the production of a clean and non-injurious milk-supply to the hospitals has been introduced by the practice of supplying to each farmer contracting for the hospitals' supply a copy of the results of the bacteriological examination of all the hospitals' milks, each source of supply being shown separately, but only the individual farmer's own name being mentioned. This stimulates a healthy competition amongst the farmers without giving any detailed information as to the results of the working of farms other than that of the recipient. Unquestionably, raw milk, produced under the best possible conditions, contains all the valuable biological and other ingredients which make milk par excellence the food of infancy, of old age, and of the sick, and it is clearly the duty of every public body to provide for the infirm in hospitals a food supply which is by nature especially fitted to tide them over the dangerous crises of their illnesses. This milk should contain to the fullest possible extent the immune or protective bodies and the vitamins, and any unnecessary and possibly dangerous bacterial contamination should be eliminated.

INCOME-TAX CONCESSION: DEPRECIATION ALLOWANCE ON MOTOR-CARS.

THE Government has now conceded the long-outstanding claim for depreciation and/or obsolescence in respect of motor-cars used by medical men. It will be remembered that on two occasions recently we pointed out the existence of a curious anomaly. The right to claim car wear and tear was confined to traders, and a doctor, whose practice equally necessitated the use of a car, could not claim the same allowance. As long ago as 1920 a Royal Commission recommended that the allowance should not be restricted to traders, and this overdue concession has at last been granted. In future medical men will be allowed each year a percentage of the written-down value of the motor-car. The allowance is usually 20 per cent. and is deducted not from the year's profits, but from the assessment average based on the preceding three years. In the event of a car being wholly dispensed with and replaced by another an allowance is made against that year's profits representing the cost of the car replaced after deducting (1) the total amount of any allowance made for wear and tear, and (2) any sum realised by the sale.

A QUEER STORY.

A CORRESPONDENT writes with indignation of a story entitled "On the Table," which appeared in *Truth* for June 24th. The gist of the story can be told shortly. Two quite recently qualified medical men, one of whom bears the well-known name of a living surgeon, share the operative work of a hospital, each of them alternately operating and giving the anaesthetic. The anaesthetist for the time being, giving chloroform and ether to a feeble old man with malignant gastric ulcer, lets his attention lapse, and finds that the patient has stopped breathing, and is in fact dead. The thrill of the story then occurs.

"He saw with appalling clearness what would inevitably happen. A death like this, actually upon the operating table, could never pass without an inquest, and an inquest meant the press. In the fraction of a second he saw it all—the headlines, the scandal, the inspired articles demanding protection for the public that could not protect itself, the verdict. That would be favourable, of course, but what would the great British public care for that beside the scandal? It must injure the profession; it must injure the hospital. . . . It was a thing too monstrous to contemplate; by some means or other it must be prevented."

To avoid all this the anaesthetist pretends to surgeon, sister, and nurse that the patient is still living; his abdomen is hastily sewn up, and he is taken back to the ward, artificial respiration being applied the while, the anaesthetist alone keeping his hand on the pulse. Only after return to the ward does he admit that there is no pulse to feel. "I am sorry to say," he says, "that this man has died." "Devilish

lucky for us," the surgeon rejoins, "that fellow did not die on the table."

It is quite wrong to suppose that the patient's death in bed subsequent to the operation would avoid the necessity of informing the coroner. The crucial point, of course, is not where the patient died, but whether he was still under the anæsthetic. Newly qualified house surgeons at hospitals in this country do not perform major abdominal operations. No doubt the attention of a house surgeon, as of any other human being, may lapse sometimes, but this simply could not occur *during* the administration of an anæsthetic. The story is written by someone without adequate knowledge.

THE TRAFFIC IN WOMEN AND CHILDREN.

THE presidents of the great women's associations throughout the world have been circularised with an inquiry as to the conditions obtaining in their respective countries in regard to the traffic in women and children. The League of Nations has now published a summary of the replies received, prepared by Mme. Avril de Sainte Croix. The answers reveal unanimity of opinion throughout the world and a general sense of need for coördination of preventive work. Its contents are already too condensed to be abstracted here and the pamphlet should be consulted by all interested in the subject. Information is given of the conditions of women in South Africa, Austria, Belgium, Canada, Denmark, America, Finland, France, Great Britain, Hungary, Greece, Latvia, New South Wales, Norway, Holland, Poland, Portugal, and Czecho-Slovakia.

AN IMPROPER SUGGESTION.

A MEDICAL man sends us a letter which he has received from the patentees and sole makers of a new self-adjusting truss for hernia, stating that several of these trusses have recently been sold direct to doctors, and have, they are assured, given complete satisfaction to the wearers. "We shall be happy," the letter concludes, "to send the truss quite free of expense for your inspection and to allow you 15 per cent. on sales." The suggestion in the last sentence is improper. The sale of any appliance on a doctor's recommendation is dependent on the patient's belief that the recommendation is based solely upon the merits of the article recommended.

INCOME-TAX ALLOWANCES.

To the Editor of THE LANCET.

SIR,—I am quite sure in my own mind that medical practitioners often overpay income-tax, and I think that here THE LANCET might be of assistance. Would it be possible to ask readers to send for your private information—unless no objection to publicity was mentioned—a list of the various allowances made to them by their local inspectors? The capricious nature of the demands made would then, in my opinion, become clear, as well as the fact that they had not infrequently been met without protest. If you could give help to readers, based on such evidence in reply to definite questions, we should many of us be very much obliged.

I am, Sir, yours faithfully,

July 1st, 1925.

A MEDICAL PRACTITIONER.

AN UNREGISTERED APPLICANT.

To the Editor of THE LANCET.

SIR,—I understand that advertisements for an assistant or a locum tenens have been answered by Mr. K. R. G. Shaw. Practitioners should be warned that, before engaging him, it is desirable that inquiry as to his registration should be made at the office of the General Medical Council.

I am, Sir, yours faithfully,

NORMAN C. KING,

Registrar, General Medical Council.

44, Hallam-street, Portland-place, London, W.,
June 26th, 1925.

COMPULSORY ISOLATION OF INFECTIOUS DISEASE.

To the Editor of THE LANCET.

SIR,—Quite recently in discussion I learned from a medical man in a rural district, and also from a member of a rural district council, that medical men possessed no power in rural areas to segregate cases of dangerous disease. I also obtained evidence that doctors and sanitary inspectors who had provided facilities for the removal to isolation hospitals of dangerous infectious cases were powerless in the face of ignorant opposition offered by parents and others. It may be news to the public in general, and to some member

of the medical profession, that doctors actually possess the requisite powers under a 50-year-old Act of Parliament.

For your information I beg to quote from a letter received by me from the Secretary of the Ministry of Health, dated June 19th, as follows:—

"I am to state that patients suffering from any dangerous infectious disorder, whether in urban or rural districts, can only be removed compulsorily to hospital in accordance with the provisions of Section 124 of the Public Health Act, 1875. That section provides for the compulsory removal of patients in certain circumstances by an order of a justice on a certificate signed by a legally qualified medical practitioner. With regard to the alleged failure to isolate patients treated in their homes, I am to refer you to Section 126 of the Public Health Act, 1875, under which, in the case of any dangerous infectious disorder, penalties are prescribed for the exposure, without proper precautions, of infected persons."

I am, Sir, yours faithfully,

HERBERT MOORE PIM.

Cley, Norfolk, June 22nd, 1925.

* * It should be common knowledge in the health service that Section 124 of the Public Health Act, 1875, allows a justice's order to be obtained for persons "without proper lodging or accommodation," and a higher court has decided that magistrates in considering "proper accommodation" may pay regard to "means of isolation." This section has been used for the compulsory removal of badly-housed cases of scarlet fever and typhoid, but the mere threat to use it is usually sufficient.—ED. L.

SALE OF BIOLOGICAL DRUGS UNDER LICENCE IN THE U.S.A.

THE issue of *Public Health Reports* for May 29th, 1925, issued by the United States Public Health Service, contains a revised table of the establishments holding licences issued by the Treasury Department in accordance with an Act of Congress of July, 1902, entitled "An Act to regulate the sale of viruses, serums, toxins, and analogous drugs in the district of Columbia, to regulate inter-State traffic in said articles, and for other purposes." The licences granted do not imply an endorsement of the claims made by the manufacturers, but the granting of a licence does mean that inspection of the establishment concerned and laboratory examinations of samples of its products are made regularly to ensure the observance of safe methods of manufacture, to ascertain freedom from contamination, and to determine the potency of those drugs for which standards or tests have been established. The American licensed establishments in this list number 36. Of foreign establishments the *Report* enumerates the following, in each case specifying the products for which licences have been issued.

Institut Pasteur de Paris. Diphtheria antitoxin; tetanus antitoxin; anti-anthrax serum; anti-dysenteric serum; anti-plague serum; anti-streptococcal serum; bacterial vaccines made from cholera vibrio, plague bacillus, *Staphylococcus albus*, and *Staph. aureus*.

Farbwerke Hoechst (vorm. Meister, Lucius and Brüning), Hoechst am Main. Diphtheria antitoxin; tetanus antitoxin; anti-streptococcal serum; normal horse serum; tuberculin old; tuberculin T. R.; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from cholera vibrio, gonococcus, *Staphylococcus albus*, *Staph. aureus*, and *Staph. citreus*; typhoid bacillus; sensitised bacterial vaccine made from typhoid bacillus; arsphenamine; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilverarsphenamine; sulphonylarsphenamine.

E. Merck, Darmstadt. Tuberculin ointment (Moro).

Connaught Antitoxin Laboratory, University of Toronto, Canada. Diphtheria antitoxin; tetanus antitoxin.

Les Etablissements Poulenc Frères, 92, Rue Vieille-du-Temple, Paris, III. Bacterial vaccines made from gonococcus, *Micrococcus tetragenus*, pertussis bacillus, *Staphylococcus albus*, *Staph. aureus*, and *synococcus*.

Laboratoire de Biochimie Médicale, 92, Rue Michel-Ange, Paris. Sulpharsphenamine.

Istituto Sieroterapico Milanese, Milan. Anti-anthrax serum, bacterial vaccines made from gonococcus, pneumococcus, *Staphylococcus albus*, *Staph. aureus*, *Staph. citreus*, and streptococcus; neoarsphenamine. Selling agents for the United States: Neother Products Co., 50, Union-square, New York City.

Boots Pure Drug Co., Ltd., Nottingham. Arsphenamine Digluconide.

Etablissements Mouneyrat, Villeneuve-la-Garenne, Seine. Phospharsphenamine.

Institut National de Vaccinotherapie, 26, Rue Pages, Suresnes (Seine). Bacterial vaccines made from colon bacillus, enterococcus, Friedländer bacillus, *Micrococcus catarrhalis*, *Micrococcus tetragenus*, pneumococcus, *Staphylococcus albus*, *Staph. aureus*, and streptococcus.

Behringswerke, A. G., Marburg-am-Lahn. Bacterial vaccines made from gonococcus, *Staphylococcus albus*, and *Staph. aureus*.

THE
Croonian Lectures

ON SOME

DISORDERS OF MOTILITY AND OF
MUSCLE TONE,
WITH SPECIAL REFERENCE TO THE
CORPUS STRIATUM.

Delivered before the Royal College of Physicians of
London

By S. A. KINNIER WILSON, M.D., B.Sc. EDIN.,
F.R.C.P. LOND.,

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SQUARE; JUNIOR NEUROLOGIST, KING'S COLLEGE
HOSPITAL; CONSULTING NEUROLOGIST, METRO-
POLITAN ASYLUMS BOARD.

LECTURE II.*

MR. PRESIDENT AND GENTLEMEN.—Hitherto our investigation of the characteristics of "voluntary" movement in affections of the corpus striatum has been prosecuted on general lines. It is time to turn to a more precise examination of individual "voluntary" acts for differing parts of the body musculature, as an essential preliminary to an analysis of various kinds of so-called "involuntary" movement occurring in these diseases. There is the more need for this investigation in that we are now approaching a clinical field where confusion reigns supreme in respect of nomenclature. Among the tangled mass of movements described by different observers as "primitive automatisms," "higher coördinations," "associated movements," "position alterations," "reaction reflexes," "reflex synergias," "movement synergias," "associated reactions," "automatised voluntary movements," "reaction movements," and what not, the student may well be excused if he loses his way. (The above terms have been culled *verbatim* from the pages of various writers on the subject and might be added to considerably.) The need for classification is urgent, but it can be met only by first analysing normal movement and by coming to a decision on definitions.

BEHAVIOUR OF MUSCULAR COMPONENTS OF
"VOLUNTARY" MOVEMENT IN STRIATAL
DISEASE.

I have already indicated the lines I shall follow in this connexion. I shall take a normal movement to have as constituents the actions of prime movers or protagonists, synergists (including fixation muscles), and antagonists respectively. I shall not call the whole a "synergic unit," or a "movement synergia," but simply a movement, with the component parts just enumerated.

The following are the single or combined movements that have been studied in normal persons and in a large number of cases coming into the category of striatal disease:—

I. Head, face, and neck.

1. Shut eyes, with or without resistance; eyeballs roll up.
2. Turn eyes to side; head turns also.
3. Open mouth, against resistance; head extends.
4. Turn eyes up; forehead wrinkles, head extends.
5. In supine position, flex head on chest; recti abdominis contract.
6. Flex head against resistance; platysmas, omohyoids, hyoid depressors contract.
7. With head in one extreme lateral position (say, right) rotate it slowly to left; left-posterior rotators contract first, and right sternomastoid only after head is well past the mid-line. And vice versa.

II. Shoulder, arm, hand, and fingers.

1. Abduct extended arm at shoulder; opposite erector spinæ contracts.

2. Adduct extended arm from horizontal position; homolateral rectus abdominis and erector spinæ contract (only if against resistance).

3. In erect position, advance extended arm to horizontal level in front—both erectores spinæ contract; rotate it horizontally backwards—homolateral erector spinæ at once relaxes; bring it forward again on horizontal level—the same erector spinæ contracts again; depress extended arm once more to side—homolateral erector spinæ once more relaxes.

4. With arm flexed at elbow and forearm pronated, supinate (biceps does this); triceps contracts to prevent further flexion at elbow.

5. Flex fingers in grasping; extensors of wrist contract. Increase grasping movements; triceps contracts.

6. Open closed hand; extensors of wrist relax; flexors of wrist contract.

7. Extend wrist with fingers closed—extensores carpi radiales and ulnaris contract; without stopping wrist extension, open fingers—the wrist extensors at once relax, while the extensors of the fingers continue the upward movement.

8. Press thumb firmly against forefinger; flexor carpi ulnaris contracts.

9. Abduct little finger; extensor ossis metacarpi pollicis contracts.

10. Extend thumb; extensor and flexor carpi ulnaris contract.

11. Abduct forefinger; thumb nearly always flexes or adducts and, if so, extensors of thumb contract.

III. Trunk and legs.

1. Supine position; lift one extended leg (i.e., flex at hip); contralateral hamstrings (internal or external group, or both) contract.

2. Supine position; lift head and shoulders up; recti abdominis contract, then both recti femoris.

3. Erect position; abduct one extended leg at hip; opposite tensor fasciæ femoris contracts.

4. Flex spine—i.e., bend forwards (not against resistance); both erectores spinæ contract.

5. Bend backwards—i.e., extend spine; recti abdominis contract. Combining (4) and (5), recti and erectores alternately contract and relax.

6. Incline spine to right or left; opposite erector spinæ contracts.

This scheme contains a description of the precise behaviour of muscular components in a number of normal movements and movement-combinations, and has been carried out *in extenso* in many examples both of paralysis agitans and of postencephalitic Parkinsonism.

With minor qualifications to be referred to immediately, my definite conclusion is, that these movements are executed normally by Parkinsonians—that is to say, the movements follow normal physiological lines and are neither lost nor perverted. I have not seen a single instance either of failure to perform the movement (except as below), or of interference with normal physiological order. In what might be termed "movements of sequence" (viz., I. 7, II. 7, III. 5 above), I have not found any departure from the normal. By this term I mean movements which are begun by one muscle or muscular group and continued by another. My former chief, the late Dr. C. E. Beevor, devoted attention to these, showing the order of action to be so fixed physiologically that it cannot be voluntarily modified, and that if one muscle in the total act fails its place cannot readily be taken by another which might appear suitable for the purpose. He said, "it rather reminds one of some highly organised establishments where if one of the servants is incapacitated it is no one's place to do the work, which is consequently left undone." The qualifications I would make are, that if the action of the agonists is inherently weak that of the other components is correspondingly feeble and therefore difficult to recognise, though as a general rule the introduction of an element of resistance against which to work intensifies the "voluntary" effort and so may bring out the constituents better. For example, I find that the triceps often will not partake in the hand-grasping movement (II. 5 above) because the latter cannot be executed with sufficient power. Further, some of the finger movements specified above, notably abduction of the little finger, may in fact almost fail, for reasons already sufficiently

* Lecture I. appeared in THE LANCET last week.

gone into. Again, in some normal persons part of the movement is facultative rather than obligatory—e.g., in I. 4 the forehead may not wrinkle; we must avoid, therefore, an overestimation of such “loss” in Parkinsonian cases. The study of these movements, finally, in seriously advanced cases of the disease is open to the objection that myogenic contractions may have set in, and this will naturally vitiate the clinical findings.

FIG. 12.



Curves of contraction of the recti femoris in the combined movement of sitting up from a supine position. Unilateral Parkinsonian case. The affected muscle (left) contracts about three-quarters of a second later than that on the normal side.

yet to describe it as “lost” and at the same time to ignore the multiplicity of factors in Parkinsonian immobility would be a mistake. Of the comparative slowness with which the above enumerated movements are sometimes performed there can, of course, be no question, nor of the frequent weakness of some of them. In respect of the slowness, the records from unilateral cases of postencephalitic Parkinsonism are instructive. In the movement of raising the shoulders from the supine position (III. 2 above) the normal individual contracts both recti femoris simultaneously and within a very brief period after the shortening of the recti abdominis. In unilateral cases delay in the contraction of the rectus femoris on the affected side has been constantly found, but I have failed to note any difference in this respect in that of the twin recti abdominis. For example, Fig. 12 gives a tracing from a case of this kind, showing on the Parkinsonian side a delay of about three-quarters of a second in the contraction of the muscle on the front of the left thigh compared with that on the right (unaffected) side. Fig. 13 gives another record of the same kind, where the difference in time of contraction is almost one second. The fact that I have found no certain distinction in rate of contraction between the two recti abdominis (once or twice a very slight retardation on the affected side has seemed present) is doubtless to be explained by the physiological unity of the two (though to this there are exceptions), according to Broadbent's hypothesis. But the difference in the case of the two recti femoris is striking. Their rôle in the movement is that of accessory prime movers; arising from the ilium, they are flexors of the hip and their shortening serves to bring the pelvis into a more vertical position. No delay in contraction took place as regards the first prime movers (recti abdominis) in the cases from which the tracings were obtained, no doubt

The main conclusion stands, and has weight. I find myself, therefore, unable to confirm in a general sense the observations of Foerster, who states that in pallidal cases (as he calls them) the eyes do not roll up when they are closed against resistance, the head does not move when the eyes are deviated laterally, and so on. As a consequence, the theory according to which the “loss” of these “Mitbewegungen” (an unfortunate terminology), in reality the components in a total single movement, is held to prove that the corpus striatum is a “centre” for their normal activation, is shown to be based on erroneous observation and to have no foundation in fact.

I may take this chance of again entering a caveat against the view that because muscular action is hindered or encounters obstacles it is *pro tanto* “lost.” In some instances of excessive muscular rigidity, especially among postencephalitic cases, the movement of the head accompanying lateral deviation of the eyes is minimal, again entering a caveat against the view that because muscular action is hindered or encounters obstacles it is *pro tanto* “lost.” In some instances of excessive muscular rigidity, especially among postencephalitic cases, the movement of the head accompanying lateral deviation of the eyes is minimal,

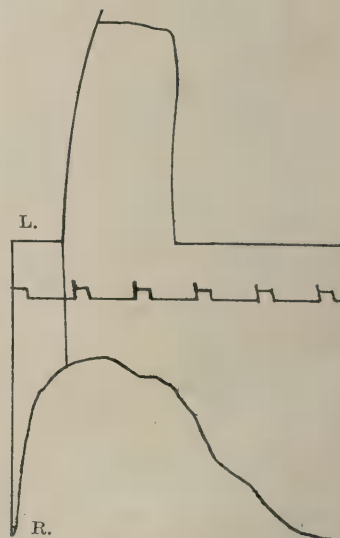
owing to their bilateral innervation. The two recti femoris contract with equal power, as the curves indicate; and when the patient is given the order to lie down again it is seemingly the healthy muscle that decontracts the more slowly, the Parkinsonian muscle relaxing faster (Fig. 13). No trace of tonic innervation or of slow relaxation with a “lengthening reaction” is here observable.

In some instances from my records, on the other hand, weakness is discernible while slowness of contraction or relaxation cannot be detected. We have seen (II. 6 above) that when the closed fist is opened the extensors of the wrist immediately relax while the extensors of the fingers contract. Fig. 14 shows the constituent actions as they occur in the normal individual, relaxation of the former and contraction of the latter being practically simultaneous. Figs. 15 and 16 are from cases of Parkinson's disease; in Fig. 15, on the signal given, the wrist extensors are seen to relax at the same moment as the finger extensors contract, without any retardation, and notwithstanding the obvious tremor with which the movement is accompanied. In Fig. 16 the lower tracing shows clearly the gradual weakening of the contraction of the wrist extensors before the signal—in other words, the inability to maintain an innervation which often characterises Parkinsonism. On the signal, however, the normal procedure at once occurs, though the decontraction of the wrist extensors is fractionally slower than the contraction of the finger extensors and exhibits the so-called “cogwheel” phenomenon (to be afterwards discussed).

Equally instructive are the tracings of the combined movement described under II. 3 above. The extended arm (say, left) is advanced to the shoulder level in front, swept back in a circle—on this horizontal level, brought forward again, then down to the side. As this is being done the left erector spinæ contracts, relaxes, contracts again, relaxes again.

Fig. 17, from a normal individual, is to be compared with Fig. 18, from a severe case of chronic postencephalitic Parkinsonian syndrome. It must be borne in mind, to understand the meaning of the tracings, that in the erect position the erectors spinæ of the normal person are not in action; in the Parkinsonian, with his typical forward inclination of the trunk, they are, on the contrary, in strong (“involuntary”) contraction. Now when the two records are examined the reader will see that, notwithstanding the steady “postural” contraction of the spinal muscle in the Parkinsonian, its successive “voluntary” contraction and relaxation follow normal physiological lines; it rises and falls exactly as does the normal erector spinæ, at the appropriate signals. Particularly instructive are the two points (1) that at the beginning of the “voluntary” movement the already posturally contracted erector spinæ contracts still further; (2) that when it is beginning to relax normally as the movement is coming to a close it springs again into this steady “involuntary” contrac-

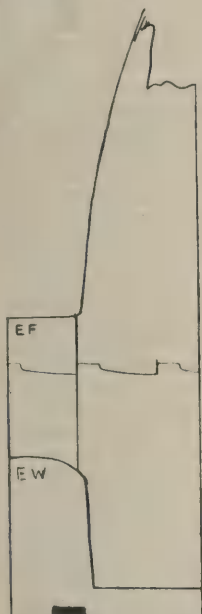
FIG. 13.



Similar to Fig. 12. Unilateral Parkinsonian case. The rectus femoris of the normal side (right) contracts before the other and also takes longer to decontract as the patient lies back again.

tion. (Although the Parkinsonian record is slower than the other the two are not in this respect comparable, since no attempt was made to have the patient perform the movement quickly.) The actions of the erector spinæ during the execution of the combined movement are not characterised either by undue retardation or by limitation of range; that

FIG. 14.



Normal hand, with fist closed "voluntarily." On the signal ("open the hand") the extensors of the fingers contract and the extensors of the wrist relax simultaneously.

(c) (Fig. 18), and at (d) (same Fig.), but the former, according to the usual conceptions, is "voluntary" and the latter "involuntary." As a clinician, I cannot say where "volitional" activity ends and "non-volitional" activity begins.

The conclusion is, that notwithstanding weakness, slowness, rigidity, and tremor, the ordinary muscular components of "voluntary" movement behave physiologically in cases of striatal disease, contrary to the views of not a few writers on the subject.

We may now pass to the consideration of another class of movement, which I shall call

MOVEMENTS OF COÖPERATION.

By this expression I wish to signify movements that are auxiliary to other, also "voluntary" movements, preceding or accompanying these as the case may be. Thus when a person seated on a chair is requested to stand up he first of all brings his feet in underneath his body, to a sufficient extent, in any case, to place them under, or almost under, his centre of gravity. An essential preliminary to the main movement, the rising up, it aids the latter by enabling it to be performed with appropriate ease and may therefore be described as a movement of coöperation. Other writers have called it an "associated movement," an "automatic movement," a "reaction movement," and have declared specifically that such are defective or lost in disease of the corpus striatum. The expressions, "automatic movements" or "automatisms," however, must be avoided, for all degrees exist, from "most automatic" to "least automatic" (i.e., "voluntary"), and no one can say when a movement passes out of the "voluntary" into the "automatic" group. If I have to go down an

unknown staircase in the dark, I will gauge the height of the first few steps by feeling with my feet; having estimated it I will probably thereafter proceed more quickly, but I do not pass from a "voluntary" to an "automatic" movement thereby, as if these are two different sorts of movement; my stepping movement, a "voluntary" movement, is "variably automatic." Nor is it appropriate to call the movement of drawing the feet under the body a "reaction movement," as Foerster does; in one sense all movements are reaction movements, and the expression becomes meaningless. I shall reserve the term for another group (to be referred to immediately) where definite stimuli are used to provoke response. Finally, as we shall see, the expression "associated movement" is equally devoid of specificity unless it is properly restricted in its connotation.

This movement of coöperation, then, I have found to be as a fact present in all cases of Parkinsonism provided the feet are, prior to the assumption of the erect position, placed a little way out from the chair. Applying the test to normal individuals, I have noticed that they can rise up without this auxiliary and preliminary leg flexion as long as the knee angle does not exceed, say, 135° ; even then, only with an obvious effort do they "throw themselves" up. Exactly the same principle applies to the Parkinsonian; since he rarely sits with limbs extended, and his

FIG. 15.



Case of severe Parkinson's disease. On the signal ("open the hand") the extensors of the fingers contract and those of the wrist relax simultaneously, in spite of rigidity and tremor.

FIG. 16.

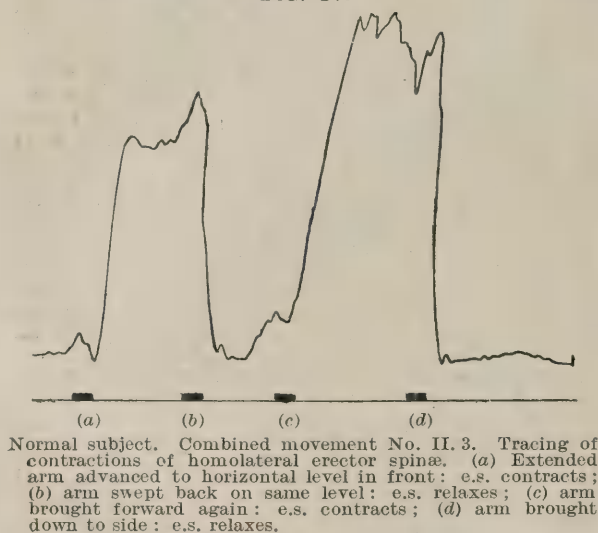


Similar case to Fig. 15. Same correct physiological interrelation of extensors of fingers and of wrist. Note how the "voluntary" contraction (synergic) of the extensors of the wrist weakens before the signal (inability to maintain a "voluntary" contraction).

customary attitude is one of flexion, his feet are already in a position *de choix* as a rule, and he can rise without the auxiliary flexion, but put them out a little and invariably he brings them in to begin with, slowly and unequally as may be. To say that this and analogous movements are "lost" and to argue therefrom that the corpus striatum is a centre for "automatic" or "associated" movements is, therefore, a fundamental mistake. Similar remarks apply to the slight outward movement of the feet (extension of the legs) which takes place almost invariably after the normal person has resumed his seat, provided his limbs are close to the chair, or touching it, as he sits down. (This movement, however, is scarcely one of coöperation,

but rather of relaxation, since sitting with limbs flexed at the knees to less than a right angle may become uncomfortable.) The common flexion attitude of the Parkinsonian explains the usual absence of the little outward extension, but in not a few cases (and these not instances of only moderate rigidity) it is readily observable. In one case of bilateral Parkinsonian

FIG. 17.



symptoms (left side more affected than right) the movement constantly occurred on the left side, but never on the other.

Another movement of coöperation to which attention has been given is that accompanying the movement of turning round on a chair. When a person, seated on a chair, is asked to turn—i.e., move his body—round to right or left (hands clasped in the lap), he first of all abducts the leg of the side to which he is to move, then as this auxiliary movement is closing he turns his body, and when the latter movement, similarly, is coming to its end he moves up the other leg in adduction to its fellow. As a rule the head turns simultaneously with the trunk. In the case of Parkinsonian patients the same sequence is commonly observable; occasionally the contralateral leg is slightly adducted before abduction of the homolateral limb, while the head may turn before the trunk, curiously enough. No outfall of subsidiary movement is found to occur, however, in spite of these occasional variations, which, for that matter, sometimes characterise the same act in the normal person.

More interesting is the swinging action of the arms in walking, and in a way more important, in view of the fact that it is constantly referred to as an "associated movement," and its supposed "loss" in striatal disease as constantly taken to argue the existence of a physiological centre for "associated movements" in the normal corpus striatum.

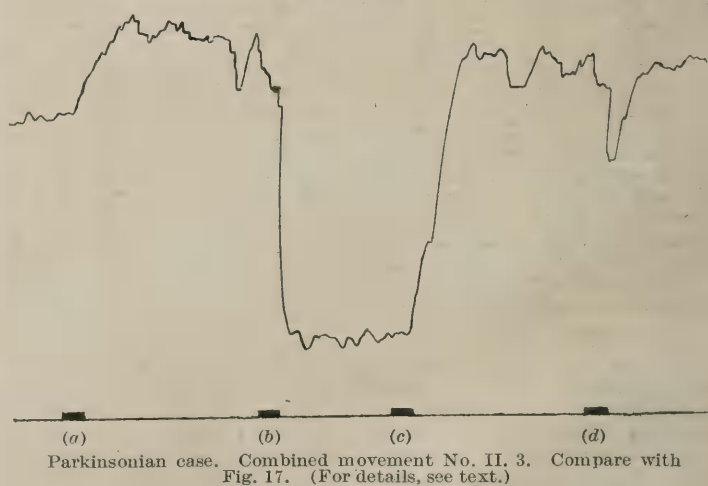
"ASSOCIATED" MOVEMENTS.

Few terms are as much in vogue and at the same time as vague in meaning as this is, and its inherent indefiniteness will remain, unless, indeed, each writer will specify the exact sense in which he employs it. In ordinary neurological parlance the term, I take it, is used to denote the involuntary movements of one limb, say one arm or segment of the arm, which may be seen to accompany forceful voluntary movements of its fellow on the other side. Such movements have

long been known to be readily elicitable, more particularly in cases of hemiplegia and diplegia—in the former condition usually from the *sound* to the *affected* side, in the latter indifferently from either. The "associated" movement on the second side may, or may not, be a "mirror" movement of that on the first side (to employ the expressions devised by Hughlings Jackson in his descriptions of the variety of epilepsy that bears his name); it often "spreads" on the second side in a way not to be seen on the first. Foerster speaks of them as "the normal [sic] synergias of pyramidal cases"—an unfortunate expression, in view of the fact that they are found in diseased states. It is confusing to find included by Foerster under the same term those muscular actions (extension of the wrist during closure of the fingers, &c.) which we have seen are precisely the normal muscular components of a total single normal movement. Moreover, this author places in the same category of "normal synergias" the spread of movement in hemiplegic cases from one group to another in the *same* limb, as when such a patient cannot flex his forearm without pronating and abducting at the same time, and also the "mass movements" of tetraplegia and spastic paraplegia. No distinction, apparently, is drawn by him between the "associated movements," in his sense, of normal individuals and of hemiplegics, normal and abnormal being classed together; and, finding them both wanting, as he considers, in pallidal cases, he reaches the conclusion already indicated, that the normal corpus striatum is the centre for this type (these types) of movement.

There is here, I consider, a plain error of deduction. Most observers are agreed on the general absence in striatal cases of the above-mentioned and well-known "associated movements" of pyramidal cases, wide-spreading, tonic, reflex movements which are the result of release of function of lower and older motor mechanisms, and which are pathological in the sense that for their appearance a pathological condition of the corticospinal system is usual. But it is illegitimate to maintain that the absence in *striatal* disease of

FIG. 18.



the pathological "associated movements" that are proper to the diseased *pyramidal* system argues for their localisation in the basal ganglia. Taking Foerster's own statement, that they are also to be found in the form of "mass movements," we know the latter may be seen in cases of total transverse lesion of the cord—a condition with which the corpus striatum has nothing to do in any direct sense, since it is anatomically severed and as much out of action as in destroying striatal lesions. The conclusion is *unmistakable*, that this type of "associated movement" is not effected through the globus pallidus and has no connexion therewith.

As for the ordinary "movement synergias" of normal persons—i.e., the normal muscular components of a single movement—the "normal involuntary associated movements of agonistic synergists," in Foerster's elaborate phrase—we have already found them to be typically present in Parkinsonian and other striatal cases, and it is therefore impossible to subscribe to his theory, that they are effected by sensory impulses streaming to the globus pallidus via the optic thalamus from the beginning to the end of "voluntary" movement and *ipso facto* disappear in disease of that part of the basal ganglia. This theory is based on erroneous observation.

Arm-swinging in Walking.

Leaving pathological (pyramidal) "associated movements" and normal components of "voluntary" movement (which ought never to be classed in the group under discussion) on one side, we next ask ourselves whether any other variety remains. And here we may revert to the question of the swinging movements of the arms in walking. My own investigations lead me to suggest they should be regarded rather as "movements of coöperation" in the sense defined above. They are auxiliary movements, practised to enable the individual to maintain balance better during the act. Though normal, they are in no respect inevitable, for the simple reason that anyone can walk with his hands clasped behind his back, or with his arms held stiffly in front or in any other artificial fashion. He will at once, however, be conscious of the lack of ease in walking thus, and will revert with relief to the normal swinging. At the other extreme is the powerful use made of the swinging arms by expert athletes in walking races, when the upper limbs can be seen to be voluntarily utilised by exaggerated sweeping movements across the chest with a view to facilitating progress. I cannot assent, therefore, to the opinion either that this arm movement is a constant normal "associated movement," or that it is purely "automatic."

Of its common reduction or cessation in Parkinsonian cases let me admit at once there can be no question. If the normal individual is carefully watched, the movement, I find, largely consists of moderate flexion at the elbow, with but slight advance of the limb at the shoulder. On the whole, the arm moves through a wider range in front of the mid-axillary line than behind it. Now if a Parkinsonian be watched as he walks with body stripped, absence of any forward movement at the shoulder will at once claim the observer's attention, and as a slight advance at the proximal end of the limb would, of course, result in a materially wider excursion at the distal end, its failure to occur will affect the whole limb. In a fair number of instances, however, some flexion at the elbow takes place. In other, asymmetrical, examples of the disease the less affected arm will move with some freedom as compared with the worse; in unilateral cases the sound arm will move normally enough, but this class of case sometimes presents unusual and interesting features. A moment's thought will remind us that the normal arm is moving with the impeded leg, and I find on observation of several such examples that the movement of the sound upper limb is made to correspond with and in a sense to compensate for the defect of the opposite lower limb. Thus in one case (largely right-sided) the left arm was always advanced to a distinctly *greater* extent than usual, and this corresponded strictly to a slower advancement of the weak right leg. In another case (also right-sided), the normal left arm was never quite at the side, but was held in advance continuously and made a swinging movement through a rather reduced range in this advanced position. In unilateral instances the movement of the sound arm is "variably automatic."

It is instructive to note how frequently intelligent patients are aware of this imperfection of arm-swinging during their walk, even at a comparatively early stage, but if they are asked deliberately to swing

the arms—"as they should do"—curious effects may result. For example, while some will manage for a time to move the arms alternately and appropriately, the movement will have a somewhat unnatural look; others, again, as I have seen more than once, move the arms forward and backward together in a ridiculous way; another patient (unilateral left-sided case), told to swing the left arm "properly" as she walked, did so only at the expense of the right arm, saying, "if I try to swing my left arm my right arm stops swinging." Patients, too, who when given a similar request hold both arms forward with a minimum of swing have been observed. In one case the patient made the spontaneous remark that the left arm (affected side) "felt different"; "in walking I feel as if the left arm has no weight, as if it were hanging by a thread." Another made the candid and illuminating observation: "It is easier not to swing my arms."

The explanation of this frequent though not universal phenomenon is to be found by reference to more than one consideration. Undoubtedly the factor of proximal rigidity plays a significant rôle, as is immediately evident when the patient walks stripped; involuntary contraction of deltoid and upper arm muscles keeps them relatively tense, and no alternating "play" between anterior and posterior groups is observable. I have not yet seen a case of reduction of this specific arm movement in which these muscles could be said to exhibit normal muscle tone. The hemiplegic patient does not swing his rigid arm. The matter of muscular "effort," again, cannot be ignored, and the same remarks are applicable in this respect as have been offered above, apropos of the Parkinsonian's general immobility. Largely "automatic" though the arm-swinging be, it encounters resistance; hence not to do it is "easier." In forcing the movement deliberately the Parkinsonian encounters the same difficulty as with any of his "voluntary" movements, and the result is one or other of the various anomalies already enumerated. Nor must it be forgotten, as before-mentioned, that arm movements are not absolutely essential in the walking act, and since the patient can as a fact walk without their aid, the faint element of conscious volition which should assist in stimulating them to action is ignored.

My conclusion, therefore, is to the effect that, this arm-swinging being neither constant, essential, nor purely "automatic," and partaking more of the nature of movements of coöperation or auxiliary movements than of involuntary or reflex associated movements, its reduction or absence in cases of striatal disease cannot be regarded as in any way supporting a theory of the localisation of "associated movements" or of "automatisms" in the corpus striatum.

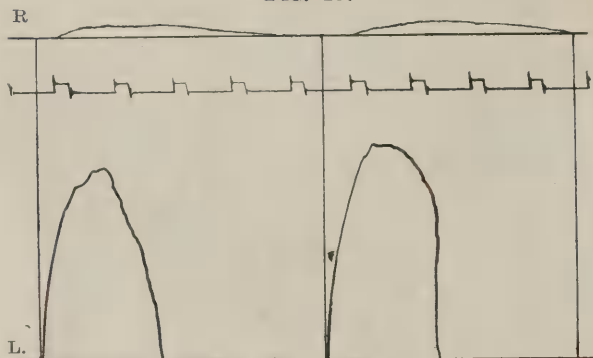
PRESENCE OF CERTAIN "ASSOCIATED MOVEMENTS" IN STRIATAL DISEASE.

Finally, under this heading, I wish to direct attention to the frequent or almost constant occurrence, mainly in unilateral cases of Parkinsonism and allied conditions, of a variety of "associated movement" from the affected to the sound side, but not, as a rule, vice versa. Many times have I had occasion to observe how in the performance of individual "voluntary" movements with the affected arm, hand, or fingers (especially in the case of the latter two) an identical, "mirror" movement is executed on the sound side, smaller in range as a rule and usually at least as slow as the other—sometimes, in fact, more prolonged. For instance, abduction of the little finger on the weak side is accompanied by the same movement of the normal finger, extension of the wrist on the affected side by extension of the wrist on the other, and so on. In ordinary bilateral cases these phenomena are very often wanting, but should one side be more affected than the other they are commonly still to be seen, always from the more weak to the less weak side. So much is this the case that the observer can thus sometimes decide, by a rapid and simple test, which of the two sides is the more involved.

The tracing reproduced in Fig. 19, taken from a unilateral case, shows how flexion of the forefinger of the affected arm (below), relatively good if somewhat tremulous, is accompanied by a fine flexion of the forefinger of the normal hand, beginning a fraction of a second later, considerably more restricted in range, and, in this instance, continuing a second or two after the movement of the first side has ceased. (Kinematograph films that I have had taken give more striking examples of the crossed muscular action.)

Movements of this character have been described in another connexion by Pierre Marie and Foix as "syncinésies d'imitation," and are stated to occur indifferently from either side in cases of hemichorea and hemiathetosis. The peculiarity here remarked is their occurrence mainly from the affected, or more affected, to the sound, or less affected, side in cases of striatal disease, which, according to the usual views, are characterised by absence of all "associated movements." Comment has already been made on the loose way in which this expression is employed, so much so that it is in danger of becoming valueless; but while the phenomena just described differ in some respects from the familiar involuntary "associated movements" of pyramidal affections they clearly exhibit in point of fact the element of "association."

FIG. 19.



Unilateral Parkinsonian case. "Associated movement" of right (normal) index finger during "voluntary" flexion of left forefinger (affected side). The associated contraction is much less in degree but lasts longer.

and deserve attention. They can be, and often are, inhibited, especially if the subject becomes aware that the examiner's attention is directed to the crossed movement rather than to the requested movement of the weak limb; but they are not found to occur in normal people, where individualisation of movement is perfectly developed, and I do not believe, as do Marie and Foix, in the existence of a "normal tendency" to imitation by one side of the movements of the other. Simple though the movement is, a satisfactory explanation is not easily found. The conjecture might be hazarded that the peculiar unilaterality, the occurrence mainly on the unaffected, or less affected, side, points to an "overflow" of the innervation current at a low (cord) level to the corresponding motor centre of the other side, conceivably because of the relative "block" encountered by it in the (affected) muscle units to which it is directed; this tendency to cross-innervation is readily inhibitable from the cortex. Since no such obstacle is met on the healthy side, there is no tendency when it is innervated for the current to cross to the affected side. I do not think that any explanation based on bilateral representation of individual movements in the cortical motor centres applies here; we cannot say it is in any way customary for such corresponding muscular groups to be innervated simultaneously and identically, at least in the case of the muscles of the fingers and hands, where marked individualisation is the rule.

In further contradiction of the general opinion as to loss of "associated movements" in striatal

affections, a word may be said on a peculiar variety of synkinesis which I first noticed a number of years ago in cases of paralysis agitans and which has been repeatedly observed in patients suffering from the diseases of this group, while it is according to my investigations of but rare occurrence in normal persons. When the Parkinsonian is asked to make a series of successive right and left conjugate deviating movements of the eyeballs (the head being kept steady) he very frequently blinks his eyelids as the eyes pass from one extreme lateral position to the other. The blinking movement, of which he appears to be unaware, is sometimes quick, sometimes slow and deliberate. In more than one case a quick double eyelid flicker has been distinctly and repeatedly observed. This transient complete or incomplete eyelid closure is the more noteworthy in that Parkinsonians as a rule are conspicuous for the poverty of blinking movements, as has been made the subject of previous allusion. Now normal subjects, who blink easily and readily, do not show this particular "associated movement" to anything like the same extent, though I do not say it is never seen. So high a proportion of Parkinsonian patients exhibit it that I have come to regard it as more typical of that condition than of any other. Yet no explanation of this eye-blinking associated movement that I can think of can be said to be satisfactory, and for the present I am content to note its existence.† (A kinematographic film of this "associated movement" was exhibited.)

Summing up our clinical data and our deductions therefrom, we are justified in the general conclusion, that striatal disease is not characterised by complete outfall of "associated movements"; we naturally do not expect the special variety discoverable in pyramidal affections to be present in extrapyramidal disease and therefore cannot in any sense describe it as "lost"; other varieties are actually found in striatal maladies and not in normal subjects; others still have been erroneously included in this class of movement and any argument based on their reduction or absence is thereby vitiated.

MOVEMENTS OF REACTION AND DEFENCE.

In this category are comprehended movements in response to definite stimuli and those performed by way of protection or defence from some noxious excitation. Such motor responses are frequently designated "reflex movements," but this term is undesirable. In the intact organism an immediate response to a noxious stimulation is called "reflex," as when the eyes are closed on the flash of a bright light (in any flashlight group photograph a percentage of the "sitters" are seen to have their eyes shut). Yet in numerous instances a conscious element cannot be said to be excluded. The hand is moved with urgency from the contact of a hot surface, but the sensory impulse must reach the cortex first, there to awaken a conscious sensation of heat. Otherwise expressed, the "reflex" arcs extend to the cortical level, and if so it is preferable they should be distinguished as a class from reflexes confined to lower physiological levels, however analogous their mechanism.

The general statement is frequently made by those concerned to defend current conceptions of striatal function that in striatal disease all movements of reaction and of defence ("automatisms") are impaired or lost, whence we may infer the tacit assumption is drawn either that consciousness enters into striatal activity or that striatal "automatisms" blend in some undefined way with higher (cortical) coordinated movements. My own observations in this respect also lend no countenance to the theory of striatal function erected thereon.

† I have under my care in hospital at present a remarkable case of postencephalitic Parkinsonism in a young woman. She exhibits extremely slow, incomplete, and punctuate lateral deviation of eyes to right and left, but she has discovered for herself that if she lets her eyelids droop, or shuts the eyes, as she deviates the eyeballs conjugately from side to side, their movement becomes at once quicker and more complete.

When testing for the class of movements now under review it is imperative the subject should have no cognisance of what is about to be tried out. I devised a series of chair-tilting tests in which the patient's chair was abruptly moved in one direction or another by an assistant behind him, while the observer was seated in front. The degree to which conscious knowledge of the tests to be made interferes with the reactions is sufficiently indicated by the remark of a patient whose responses became less and less as the examination proceeded and who, when comment was made thereon, said, "I know now you won't really let me fall off." Cases of severe generalised Parkinsonism were selected for the purpose, the patient being seated on a chair with hands on lap and then tilted abruptly forwards or backwards or to one or other side. A single series may be briefly summarised to illustrate results. In this instance the case was that of a woman of 28, suffering from the post-encephalitic variety.

(1) Tilted to L. The left leg was at once abducted, the left arm extended, abducted away from the trunk, and directed towards the corner of a table which stood near. As further falling to the left continued, the right arm was in turn brought across and directed also to the table. There was no movement of the right leg.

(2) Tilted to R. The right arm was immediately extended and abducted and the fingers extended as if to save from the floor. The left leg was notably abducted, extended, and elevated, as if to counterbalance the right lateral deviation. No movement was observed in left arm or right leg.

(3) Tilted backwards. Both arms were at once thrown out in extension in front, both legs were abducted, and slightly extended at the knees.

Pushing tests were utilised in the same case, the subject having the eyes closed to obviate foreknowledge.

(1) Sudden push backwards. Both arms were thrown out in front in full extension.

(2) Sudden push to L. and R. respectively. In each instance there was marked quick abduction of the ipsilateral leg, with slight abduction of the contralateral arm.

All sorts of variations have been seen in different subjects, and in some the reactions have been considerably restricted as compared with the above. Thus in the case of a man of 27 (postencephalitic form) in whom the left side was distinctly more affected than the right, chair-tilting to the left evoked abduction of the right leg, then feeble abduction of the left, while the edge of the chair was gripped with the right hand; whereas, on tilting to the right only the right leg was abducted, and no movement of the left limbs was detected. On sudden pulsion backwards the same individual's reaction was confined to slight but definite advancing of the right arm. Another patient whose responses to these tests seemed peculiarly meagre (a girl of quick intelligence, she early realised that she would not be allowed to hurt herself), was asked to bend backwards as far as she could, on the pretence of examination of the back muscles. The supporting hands were suddenly removed, when at once both her arms were thrown forward and she tried to catch hold of the assistant standing in front.

In view of these findings, which might be readily amplified, we shall be careful in our interpretation of the seeming absence of reaction among Parkinsonians to peripheral stimuli of differing sorts. Foerster, for example, says they exhibit no movements of reaction to irritation from flies, but neither do the moribund, nor the profoundly asthenic from serious illness, nor those in whose case for other physical reasons the reaction requires an effort. "It is easier not to." Indifference and apathy led to similar absence of reaction on the part of the long-suffering soldier on the Gallipoli Peninsula. In short, so manifold are the factors leading to this apparent poverty of reaction movements, and so clearly is there resident in them a cortical, because conscious, element, that their ascription to striatal function can be dismissed as a conjecture lacking inherent probability no less than any clinical support.

The question can be further probed by resort to the familiar tests for defence-reactions to stimuli along the sense avenues of touch, sight, hearing, &c. With the proviso that the subject be unaware of what is to be examined for, the nostril, ear, or throat can be tickled, visual or auditory excitations of a sufficiently "threatening" or "alarming" character utilised, or painful cutaneous stimuli employed, and in practically all instances a response or reaction will be evoked, proving the inaccuracy of the general statement already referred to. If the hand be suddenly passed across in front of the patient's eyes with a threatening gesture he blinks and may withdraw the head; at the unexpected bursting of an air-filled paper bag he also blinks; when the auditory meatus, or the nostril, is tickled with a paper "spill" the head is inclined away, and so forth. Only in exceptional instances do such reactions fail. Thus I have seen tears running from the eyes of a Parkinsonian when his anterior nares were tickled, yet no outward reaction was otherwise noticeable; another patient blinked his eyes when a feather entered his external auditory meatus but the head did not move away. I have convinced myself, further, of the general inaccuracy of the view according to which patients with paralysis agitans furnish no visible evidence of a reaction to painful cutaneous stimuli; on the contrary, withdrawal from the noxious excitation in my experience rarely fails. If the fauces are irritated with a paper "spill" moderate "gagging," with movement of eyes and mouth, results more or less regularly.

In seeking an explanation for the occasional absence, and less infrequent reduction, of movements of reaction and defence we do not require, as hinted above, to go past the factors already enumerated, in particular, that of awareness, the action of which has been sufficiently demonstrated. I shall not be misunderstood, I hope, when I say also that with certain patients of the hospital class the rôle played during examination by a "superior" is so passive as of itself to tend to reduce external reactions to a minimum. Many patients by no means as generally immobile as the Parkinsonian will submit to repeated pin-pricking in sensory tests with stoical calm, and the same is true of ordinary sole-stimulation in investigating the plantar reflex. As a persistent background in rigid cases is the muscular state, which of itself, as we have several times had occasion to remark, contributes to reduction of facile reactions, to an extent, indeed, that cannot be ignored.

MOVEMENTS OF EXPRESSION.

Hitherto our concern has been exclusively with the so-called "voluntary" motor system and its activities when there is reason to believe the striatal system is largely out of action, but I must now refer to another class of movement which, commonly called "involuntary," is nevertheless more conveniently discussed at this stage than later, when we come to examine chorea, tremor, and athetosis.

Scarcely any greater clinical contrast can be imagined than between the mobile and facile emotional expressions of the Sydenham's choreic and the "starched" and "fixed" facies of the Parkinsonian. In the latter it is not an absence of all expression but rather a fixity of expression, a lack of ease in passing from one expression to another, a lingering exteriorisation of emotion, with which we have to deal.

Though not specifically alluded to in the classical monograph of James Parkinson, the Parkinsonian "mask" is a classic symptom, not requiring elaboration by any writer of to-day. I may state briefly that patients can and do both laugh and cry, that their expressions frequently exhibit an exaggeration amounting almost to a *rire* or *pleurer spasmodique*, and that in unilateral cases the affected side moves more slowly than the other in the expanding or unfolding of its expression, but tends to maintain this after the other has become normal again. A distinction is to be drawn, none the less, between the

true *rire et pleurer spasmodiques* of the pseudobulbar and the exaggerated facial emotional expression of the Parkinsonian, in that the "convulsive" element of the former is wanting in the latter instance, in which also there is far less implication of the respiratory part of the mechanism for the display of emotion, while the quality of the laugh is often inferior. As a postencephalitic patient remarked, "I used to have a ringing laugh, but now I make a silly noise." It is not that, as in pseudobulbars, double hemiplegics, cases of disseminated sclerosis, and so on, the facio-respiratory emotional apparatus is "released" into exaggerated action, but that the apparatus itself, an "involuntary" mechanism, is subject to the same muscular disabilities, so to speak, as have been described in the case of the "voluntary" motor system. For we are dealing, as is immediately understandable, with skeletal, not with unstriped, muscles; the problem pertains to the "involuntary" use of a "voluntary" musculature. Now there is no good reason to suppose the "inward" or central (psychical) part of the mechanism has undergone a change; the Parkinsonian is no less conscious than the normal person of the stimulus that conduces to laughter or awakens tears; hence such abnormalities as he shows must be set down, *inter alia*, to the existing hypertonic condition of the muscles involved, that rigidity which seriously interferes with facility in or versatility of muscular play. In a study of the subject published a year or two ago attention was specifically drawn to impairment of the expression of the emotions from organic lesions, and allusion was made to alterations consequent on paresis, rigid, ataxic, and other states of the facio-respiratory apparatus; among these, Parkinsonian rigidity is to be included. The important point that I wish to make at present is that the *mimic or expressional movements under consideration are "most automatic" or "least voluntary," but they nevertheless reveal disorder of function as definitely as do so-called "voluntary" movements.* (I am in no sense dealing here with the varying respiratory disturbances that have been observed within the last few years among the sequelæ of epidemic encephalitis.) It is the more necessary to stress this point in view of the distinction which some have attempted to prove exists between "voluntary" and "involuntary" use of the musculature in paralysis agitans, the former exhibiting defects of function and the latter not. The evidence now adduced lends no support to this attempted differentiation. (See also below.)

Poverty or lack of movements of the limbs in gesture and expression is, of course, a mere corollary of what we have learned as to the "Bewegungsarmut" in general. The "mimische Starre" or mimic fixity of the Parkinsonian, inclusive both of facies and of limbs, is a consequence of more than one factor, of factors already sufficiently discussed, and is, in my opinion, erroneously described as a mimic "paralysis," for reasons given above. Hence, when Binswanger and others argue as it were backwards from the symptomatological to the physiological, and place in the corpus striatum a "higher coördination centre for unconscious mimic and gesture play," they misinterpret the clinical phenomena in the first instance and overlook other significant clinico-anatomical data in the second. For, in the article already alluded to on "Pathological Laughing and Crying," I have brought forward evidence to suggest that there are corticifugal (non-pyramidal) paths from the frontal lobes via the optic thalamus to the facio-respiratory centres in the pons and medulla, and that these are the routes taken by emotional impulses to modify the facio-respiratory synkinesis in the direction either of laughter or the reverse; genuine absence of emotional movement, genuine emotional palsy, occurs from lesions situated *ex hypothesi* anywhere on these tracts, from the cortex to at least as low as the pons. *No theory attributing emotional disorders to disease of the corpus striatum alone can be accepted, since it fails to include a number of germane clinical and pathological facts.*

MUSCLE TONE.

By muscle tone is commonly understood that condition of contraction of a resting muscle which exists without "voluntary" innervation and which holds the limb in a given position. It also exists when the limb is passively supported, for the muscles do not "sag" or hang flaccid. When, further, the limb is passively moved a mild resistance to the displacement is encountered; when it is held and shaken the segments concerned exhibit no flail-like swinging as do those of a limb considered to be hypotonic or atonic. Thus muscle tone gives a shape to muscles, and is in evidence both in resting (static) and moving (kinetic) states of the musculature. According to the researches of Sir Charles Sherrington, tone is in reality postural contraction, that is to say, it is a moderate contraction of muscle-fibres effected reflexly by sensory excitations arising in peripheral end-organs, substantially those of the muscles themselves. In virtue of this reflex contraction, a muscle will adapt itself to the maintenance of any posture, whether the fibres are in fact in a shorter or longer anatomical state; the property of adjustment of length of fibre, and of exercise of contracting power whatever the length, he described as "plasticity," whence has arisen the use of the term "plastic tone," to be referred to immediately. All clinicians agree that lesions interrupting the proprioceptive reflex are underlying muscle tone confirm the conception by producing, as a fact, loss of tone.

The point next arises whether this muscular function of reflex contraction is subserved by all or by a special group of striated muscle-fibres. I can now only refer in the very briefest fashion to a hypothesis that has gradually developed more particularly during the last decade, to the effect that all fibres partake in postural tone but that (as the form of the hypothesis due especially to Hunter has it) there is a subdivision of labour, so to say; some fibres, said to be histologically recognisable, are innervated by the motor or efferent limb of the proprioceptive arc alluded to above—i.e., by the somatic nervous system—and contract reflexly during change of posture; they are considered to be responsible for what has been called "contractile tone," because they contract in response to appropriate stimuli. Other fibres, stated to be histologically distinguishable, are innervated by the sympathetic nervous system, but they are not contractile; their length is supposed to be *passively* altered during the activity of neighbouring contractile fibres (the first group); and their postulated function is to remain at a given fixed length once movement of the others has ceased, and thus to aid or support the maintenance of posture determined otherwise. They are said to be responsible for "plastic tone"—i.e., the element in postural tone concerned with the adaptation of a muscle to the new posture assumed after movement. "Plastic tone" and "contractile tone" together make up "postural tone."

While Hunter asserts the sympathetically innervated fibres for "plastic tone" are *non-contractile*, he makes no reference, as far as I have seen, to the old Vulpian's phenomenon (1862), recently reinvestigated by Langworthy. The latter finds that stimulation of the lingual nerve (containing bulbar autonomic fibres) leads to slow wavy contractions of the tongue muscles after complete degeneration of the hypoglossal nerve-endings by previous section, and is inclined, therefore, to believe in the possibility of *contraction* via the sympathetic nervous system.

Be this as it may, the identity of tone and of contraction cannot be seriously questioned. For physiological proof of this statement the clinician has to turn to recent work with the string galvanometer (personally I have had no opportunity of prosecuting such researches and must rely in this respect on the investigations of others). Very briefly, it has been shown by exact methods that an action-current exists in normal muscle at rest, that there is no notable difference in the action-current as between active ("voluntary") movement and passive move-

ment, that the action-current of normal muscle differs from that of rigid and spastic muscles only quantitatively, not qualitatively. Further, the curves of the current during passive movement of a hypertonic muscle are the same as those of strong "voluntary" innervation; no qualitative distinction is to be found between the action-currents (during both active and passive movement) of Parkinsonians and of hemiplegics; or between the action-currents of the same conditions when the muscles are at rest. In respect of this latter point, the curves both in hemiplegia and in paralysis agitans are more marked than in resting normal muscle, and in paralysis agitans rather more than in the pyramidal affection (Hansen, Hoffmann, von Weizsäcker, Wachholder, Mann and Schleier, and others). The general conclusions are, that tone and "active" innervation are analogous phenomena, that only quantitative differences are to be detected between the action-currents of "voluntary" innervation and of hypertonic states of pyramidal and extrapyramidal origin, that the muscle tone exhibited on passive movement in these morbid conditions (resistance to stretching) is entirely analogous to the so-called tetanic innervation of "voluntary" contraction. A number of years ago Lewandowsky maintained that "tonus is nothing else than the observation of a particular attitude for which the same laws hold good as for the carrying out of a movement."

What actually happens when "volition" innervates a resting tonic muscle is probably that it strengthens the existing ("involuntary" or reflexly produced) contraction, as is suggested by a significant experiment of Graham Brown, to which attention was drawn in my paper on "The Old Motor System and the New." According to Holmes, tone "fuses with muscular contractions otherwise aroused [e.g., by 'volition'], reinforcing them, making them more tonic." The reader is referred again to the tracing obtained from the erector spinæ of a Parkinsonian during the combined arm movement described above (Fig. 18). From this record it is clearly established that the existing "involuntary" or postural contraction of that muscle (its tone—in this instance, hypertonia) is *reinforced* by the "volitional" element of active contraction, so that the curve rises still further, if somewhat slowly. I attach importance to this demonstration, since Hunter asserts (without, seemingly, offering evidence in support) that "in voluntary movement postural tone, made up of a contractile and a plastic component, is first *inhibited*" (italics mine); according to my observations this is incorrect.

The difficulties of gauging tone by ordinary clinical methods are considerable; we estimate the "feel" of the muscles by reference to our own subjective standard based on knowledge derived from palpation of many presumably normal muscles; we observe attitude; we impress a passive movement on the muscle concerned; we calculate its "stretchability." From what has been already shown at various previous stages in our discussion, the difficulty is increased by inability to separate "voluntary" from "involuntary" contraction by objective clinical methods; by the fact that the conscious patient will often "unintentionally" coöperate during passive movement, so-called; by the varying degree of "automatism" in any frequent movement; by recognition of the truth that not all attitudes are "involuntary." In view of the physiological data obtained by the string-galvanometer method, moreover, we are really asking ourselves to estimate merely *quantitative* differences, a task of obvious arduousness. While major degrees of hypo- or hyper-tonia do not, as a rule, offer any difficulty, minor degrees escape us clinically, and the passing from a reflexly determined contraction to an incipient "voluntary" contraction (without displacement) is for practical purposes not determinable. Conversely, we lack methods for gauging with exactitude at what point a postural tone reaction fixes or stabilises a movement begun by "volition."

A further introductory word is necessary in respect of the recent tendency to differentiate somewhat rigorously and schematically movement from posture, and kinetic from static muscular contractions. Speaking generally, "volition" is taken to imply *movement*, and reflex action, *posture*, yet the inapplicability of the generalisation must be plain to the reader; posture is often maintained "voluntarily," and much reflex action is of a definite kinetic character. Movement is in reality a series of changes of posture, and Sherrington has stated that the distinction between reflexes of posture and reflexes of movement is not clear-cut. That two entirely separable mechanisms should be responsible for posture and movement respectively is *prima facie* improbable, in view of this statement of Sherrington's for reflex action, and of the known phenomena of "voluntary" action. Cogent arguments against this differentiation have recently been urged by Bard, with whose contentions I find myself in substantial agreement.

MUSCLE TONE IN STRIATAL DISEASE.

Study of an average case of Parkinsonism or of progressive lenticular degeneration, even by the comparatively crude clinical methods to which we have resort, at once reveals the presence of increase of muscle tone. The muscles stand out and have shape; where their tendons are visible these are salient; to the palpating finger they are firm and tense; they offer definite resistance to passive extension, and more force is required to effect passive displacement. Further, such patients exhibit "at rest" an attitude, indicative of access of tone in certain groups.

Distribution of Muscle Hypertonia.

The bellying of the skeletal musculature is more or less universal, but is more recognisable, on the whole, in those groups whose contraction underlies the maintenance of specific Parkinsonian attitudes (sternomastoids, erectores spinæ, deltoid, biceps brachii, supinator longus, wrist extensors, long finger flexors, interossei, thenar and hypothenar groups, knee flexors, tibialis anticus, &c.). Rigidity—i.e., resistance to passive movement—is so widespread that it may be described as general, though it is more pronounced at the larger joints, being presumably there a question simply of muscle mass. Even when a limb or limb segment is passively put in such a position as to relax muscles as far as possible hypertonia is evident. In the recumbent posture the sternomastoids do not relax. When any joint of any limb is passively displaced resistance is encountered whatever the direction of the displacement. We have already had evidence pointing to the implication even of quite small muscles—e.g., those of the larynx—in this generalised rigidity, and it is doubtful whether the external ocular muscles completely escape. In the result, the patient can often be passively moved *en bloc*; if the head be rocked about the trunk follows its every move, and so on. A degree of rigidity equal to that of the severest pyramidal cases is probably attained but seldom (unless, indeed, the stage of myogenic contracture has been reached); it is not so easy to pull a Parkinsonian about by one leg, the other following, as it is in the case of a pronounced spastic paraplegia.

Characters of the Muscular Hypertonia.

When the hypertonic muscle of the striatal case is passively stretched resistance is felt from beginning to end of the movement; in the milder cases the origin and insertion points of the muscle to be tested should first be approximated and the passive stretching should be comparatively fast. If the stretching is quite slow little or no resistance may be demonstrable. The explanation doubtless is to be sought in the stimulation of proprioceptive end-organs by the abruptness of the initial passive movement, with consequent reflex increase of the muscular contraction and therefore of resistance. Strümpell is of the

opinion that striatal rigidity remains more or less the same whether the passive movement be slow or abrupt, gentle or powerful, but my observations do not confirm this view, nor do I consider it can be applied as a clinical method of distinguishing pyramidal from extrapyramidal rigidity. Figs. 20 and 21 are two records from the same muscle (biceps brachii) of an advanced postencephalitic Parkinsonian; in the former of these the muscle (already contracted) was passively and slowly extended in the course of three seconds; in the latter, the same movement was made abruptly and strongly, occupying not more than a quarter or a third of a second, and the characteristic "cogwheel" character of the resistance stands out with greater clearness in it than in the other.

The statement has already been made that the rigidity is practically universal in striatal cases; in the various divisions of the musculature it varies in degree only. It is found, therefore, in muscle groups which in pyramidal affections exhibit little or none of such hypertonia (see also below). Like one or two other phenomena of postencephalitic Parkinsonism, it may show a curious reversibility, fluctuating from time to time in an unexpected degree—a character not met with to the same extent in pyramidal cases. In deep sleep careful observations by my house physicians have proved it to be markedly reducible, frequently if not constantly. Cutaneous sensory stimuli exercise no apparent effect on its character; it is not temporarily "broken down" thereby, in contradistinction to what obtains in pyramidal disease. It seems to be aggravated by cold and reduced by warmth.

In spite of the plausibility of the view that muscle rigidity is mainly responsible for impairment of "voluntary" movement, I am not able to satisfy myself there is always a specific connexion between the two. I have not found that movement is always braked by the existing rigidity and brought to a standstill more or less completely and soon, as Foerster

FIG. 20.



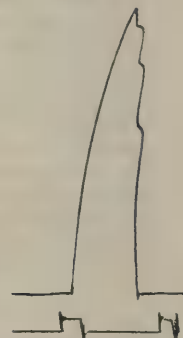
Parkinsonism. Slow passive stretching of biceps brachii.

states. If the reader will refer back to the observations described in a previous lecture in this series he will gather that peripheral rigidity is only one, and that not necessarily the most important, of the factors producing limitation of range and power, and constituting "paresis," in respect of "voluntary" contraction. I have demonstrated the physiological normality of the mechanism of volitional innervation in regard to its muscular components, concomitant rigidity notwithstanding. We have had evidence to show that "voluntary" muscular contraction blends with existing tone and is rendered more tonic. Were the rigidity really to function as a constant and immediate brake on "volition" a difference might be expected between the curve of a rigid muscle under passive and active extension respectively, since in the latter the extension is part of a "volitional" action. By physiological (action-current) methods no such difference is discoverable. With cruder clinical technique the arm of a patient with severe paralysis agitans was fixed so as to prevent any subsidiary movement; the biceps brachii was in the first instance passively stretched, the time taken

being roughly two seconds; another tracing gave active ("voluntary") extension of the same muscle, in the same time, and under the same conditions, and no distinction could be found. However, single instances must not be unduly stressed, and from this illustration, further, the inference is not to be drawn that hypertonia does not impede passive movement, for the reverse is the case. In analysis of the actual hindrance encountered by "volition" in the motor periphery due weight must be placed on the state of the antagonists, as we shall shortly see. This is of greater significance than hypertonia of the prime movers, though one might conceive so exaggerated a condition of agonist hypertonia that the incoming current of "volitional" innervation produces little or no evident result. No such case, as a fact, has as yet come under my notice.

A further word is necessary in this connexion as to the type of movement in which abnormal states of the musculature will produce its effect. From the observations made in the course of testing various kinds of movement, as described previously, the element of rigidity has been seen to contribute to the general imperfection in all; that is to say, it hampers movements of a "most automatic" kind no less than those that are "least automatic," as might, indeed, be expected. If there is a persisting background of agonist-antagonist rigidity, "volitional" innervation of a given muscular unit cannot differ from "automatic" innervation, since both use the final common path in a Sherringtonian sense. I have not found, therefore, in working on this class of case, that any support of a clinical kind is furnished to the contention of Kousnetzov, who says that in extrapyramidal hypertonia "it is above all the voluntary movements that are affected."

FIG. 21.



Same case as Fig. 20. Quick passive stretching of biceps brachii: "cogwheel" phenomenon well seen.

TREATMENT OF PHTHISIS WITH SANOCRYLIN.

BY KNUD FABER,

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WHEN we began to use sanocrylin about six months ago in the University Clinic in Copenhagen for the treatment of some cases of chronic lung tuberculosis we were prepared to see serious consequences follow the sanocrylin injections in severe cases in view of the already published experiences. In the first few weeks we also had cases in which the reactions caused by the treatment could not be controlled, so that the patient succumbed before he otherwise would have done. We fairly quickly discovered, however, what the special dangers were and how they could be avoided, and in the last five months we have had no disasters of this kind. The treatment has thus been freed from the drawback which at first attended it, and we are now in a position to judge more soberly the therapeutic results we have attained during these months.

Dangers of the Treatment and How to Avoid Them.

Before giving an account of these results it is appropriate to discuss in rather more detail the dangers which may accompany the treatment. They are fully dealt with by Secher and Würtzen in the book, "Chemotherapy of Tuberculosis."¹ What is of special interest now is to realise that they can usually be avoided. It is the present purpose to discuss these from a purely clinical standpoint without

¹THE LANCET, 1925, i., 239, 555.

entering into the still hypothetical explanations of how they arise. Indeed, the whole question of the mode of action of chemotherapeutic substances is still far from being cleared up, and the same undoubtedly applies also to this new chemotherapeutic specific drug.

The greatest risk is the occurrence of the acute state of collapse described by Mollgaard as shock. It is characterised by a marked fall in temperature, the patient becoming pale, sweating, and showing signs of heart weakness with a very rapid and small pulse, and the gradual onset of cyanosis and other signs of cardiac failure. This is the condition which is combated in a very striking manner by the intravenous injection of antitoxic serum.

Our experience is that signs of shock are most likely to occur when an injection of sanocrysin is given while the patient still shows a febrile reaction from a previous injection. As a rule, a long febrile reaction, lasting from one to two weeks, where the temperature rises and falls fairly steadily, ensues after one or two sanocrysin injections. This reaction must be allowed to pass away before a fresh injection is given, and one must watch when it begins. By giving an injection too early, just when the fever is starting, the patient is exposed to the danger of shock, and even if this does not occur the reaction is increased in strength, so that it is more protracted and violent in every respect than it would otherwise be.

The same thing may happen if the patient is febrile before the first sanocrysin injection is given. If the usual dose is administered in such a case there is a risk of shock. One must either wait until the fever has disappeared or begin with a much smaller dose. In a case of acute tuberculous lobar pneumonia that came in with a temperature of over 40°C ., we observed the occurrence of shock after a dose of only 20 cg. If one recognises these facts, shock can presumably be prevented, or at any rate, one will only get incipient shock, which can easily be controlled by an intravenous injection of antitoxic serum.

In order to avoid interfering with the long febrile reaction it is essential to bear in mind that in some cases it does not start before two to four days after the second sanocrysin injection, while in other cases it may appear after a single injection of only $\frac{1}{2}$ g. In both cases a too early injection of another dose may be dangerous.

The danger resulting from the first injections of sanocrysin following too rapidly upon one another may, however, show itself in another manner than by the occurrence of shock. The fever reaction may become too severe and rise to a fatal hyperpyrexia. When we were first trying sanocrysin, in one case where three injections were given with only one day's interval, the temperature began to rise and without intermission reached 42°C ., after which violent heart attacks and intestinal hæmorrhage occurred and death supervened.

From these facts it appears that the danger chiefly consists in the injections following too rapidly upon one another, with consequent accumulation. The same conditions also seem to reinforce the third variety of intoxication phenomena which in the form of anorexia, nausea, vomiting, and kidney disease nearly always appears during the treatment. The renal lesion manifests itself by albuminuria and casts in the urine. It seems as if the albuminuria appears in two different manners. It very frequently coincides with the long febrile reaction and is then usually of short duration, but it may also occur at a later stage of the treatment and may then last longer—weeks or even months. It is particularly this albuminuria occurring late that seems to follow too rapid injections. The longest attack of albuminuria that we observed appeared after three injections at intervals of only four days, and, in general, we have much more frequently seen severe albuminuria when the intervals have been four days than when the interval is increased to six days. Latterly, therefore, as a general rule, we have only given sanocrysin

injections once a week, and we have sometimes been able to guard the patient against albuminuria throughout the whole course of treatment. The first two injections only may be given at, say, an interval of two or three days, if no reaction has already appeared. In carrying out the scheme of treatment it is very important to avoid albuminuria as much as possible, because another injection ought not to be given so long as it exists. Moreover, albuminuria is often accompanied by the other intoxication phenomena alluded to, which bring on a state of inanition, with a consequent large decrease in weight. On the other hand, it must be pointed out that the kidney disease is very benign, being chiefly a tubular lesion of a toxic nature, and that in all our cases it disappeared without leaving permanent damage. In a single case, however, there was still a trace of albuminuria after two months.

Although the effect of antitoxic serum in cases of shock has seemed to us very striking, it is more uncertain as yet how much action it has in warding off or arresting the albuminuria, at all events when it is given intramuscularly. The serum injections appear to be particularly ineffective against the late albuminuria, but they probably have an effect upon the kidney disease when it occurs along with the fever reaction at the beginning of the treatment. We have more and more given up the use of antitoxic serum except in shock, and we have tried to avoid albuminuria by increasing the interval between the individual injections in the manner indicated.

The Rationale of Treatment.

When one pays attention to these different factors in the administration of sanocrysin, the treatment is much more simple than it appears on reading the first clinical reports. In the ordinary cases of sub-febrile or afebrile phthisis we are satisfied with the dose of 1–2 cg. per kilo suggested by Mollgaard, or more generally 0.5 g. for the first dose, 1 g. for the second dose two to three days later if no reaction occurs, and then 1 g. about once a week. In febrile patients one can begin with a lower dose—for example, half the quantity, and gradually increase it to the full dose of 1 g. In small women 0.75 g. will be sufficient. In cases with high fever it is advisable to begin with a dose of 0.2 g., and increase it very slowly.

Immediately after the injection the patient often feels indisposed and vomits, but this is purely temporary and does not last long. After this, the patient does not notice anything until the reaction caused by the drug occurs. The time which elapses before the reaction appears may vary from a couple of hours to one or even two days, and the first sign of the reaction is a rising temperature.

The rise of temperature, in the majority of my patients, has run a fairly typical course. After one or two sanocrysin doses a rise of temperature has occurred in the course of a few days, continuing for one to two weeks, exhibiting a more or less rapid rise and a steady fall to the normal again. This part of the temperature curve often shows a perfectly regular course in its rise and its lytic fall. The subsequent rises were, however, short ones, lasting as a rule only one day, the temperature falling to normal again the day after or in a few days' time, and they get smaller and smaller for each injection, and finally cease.

A rash usually appears during the first long temperature rise. It first takes the form of a morbilliform exanthema which, however, soon becomes general and confluent, so that in the course of a day or two it looks like a scarlatinal rash. The eruption persists for a few days to a week and then disappears without leaving any trace. There is commonly no exanthema or at any rate only a slight and evanescent one after the subsequent short reaction. During the long fever reaction there is frequently general malaise with nausea and anorexia, and sometimes vomiting. In other cases the general condition is very little affected. More or less pronounced pain and tenderness

of the joints often occurs during the first fever reaction, passing from joint to joint just as in rheumatic fever.

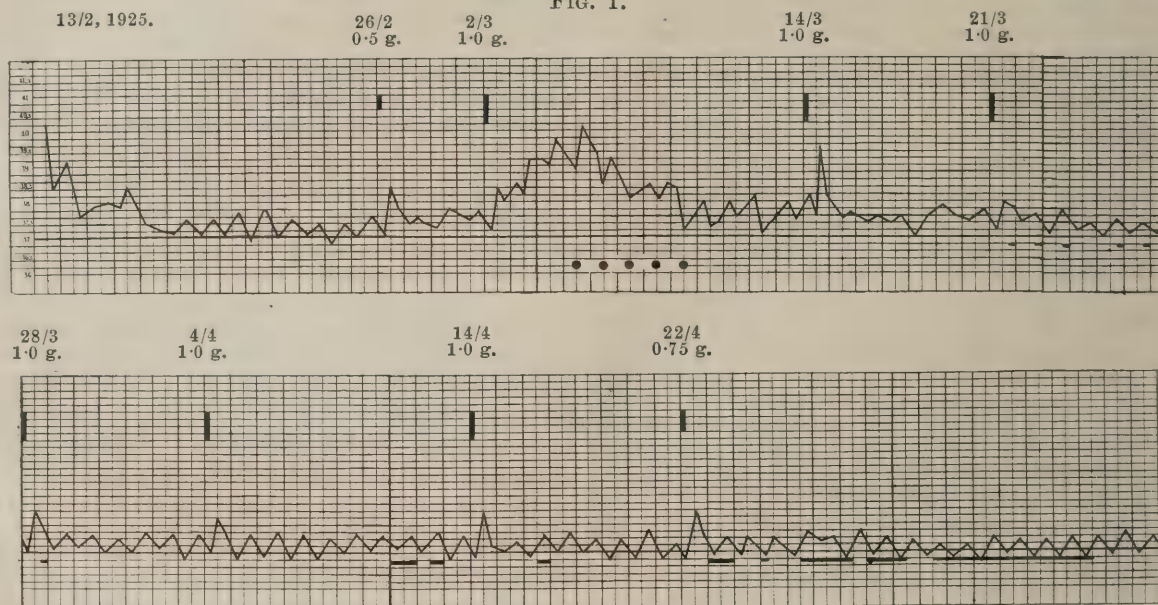
The accompanying curve illustrates such a typical fever reaction in a case where no serum was given (Fig. 1).

In other cases, however, the fever reaction is less typical, and takes the form of a rapid rise in temperature which in the course of a few days drops to normal, and the long fever reaction referred to is not seen. In many cases the fever reaction is, on the whole, very slight and may even be entirely absent. This is seen especially in old cases of chronic fibroid phthisis. In fresh cases the reaction, on the contrary, may be much more severe, and in a few cases we have seen the long fever reaction recur once or twice,

troublesome and extensive desquamating dermatitis during the treatment which, however, disappeared in all cases with suitable local applications. It appears to be quite distinct from the typical initial exanthemata. The cases are much like the dermatitis sometimes seen after treatment with salvarsan.

With the cautious treatment described we have only observed very mild local phenomena. The expectoration became rather more profuse at first, and sometimes more râles were heard in the affected parts; these local reactions may be entirely wanting. We have not witnessed any real lighting up of the tuberculous lesion in the lungs during the treatment. In two cases, however, an exudative pleurisy occurred. On another occasion otitis media developed, but a

FIG. 1.



The thick horizontal line indicates albuminuria; the thick perpendicular line, injections of sanocrysin; and the black dots, exanthema.

sometimes associated with swelling and tenderness of the lymphatic glands of the neck. In some cases, as mentioned, albuminuria and casts in the urine occur even during the long fever reaction, in others albuminuria does not appear until after the subsequent sanocrysin injections. While albuminuria is present the nausea and anorexia are more marked.

From our experience up to the present, therefore, the treatment with sanocrysin resolves itself into a short series of injections whose effect on the patient's temperature normally diminishes with each injection. At latest after the seventh to eighth injection the patient, as a rule, does not react at all to the injections or at any rate does so only with a slight rise in temperature. The treatment is then at an end for the time being, but can be repeated after a longer or shorter pause. When we have repeated the injections of sanocrysin after an interval of one or more months we did not observe typical temperature rises as in the first treatment, but, at most, a small rise lasting one or two days or else no reaction at all.

As has been said, the patients are subject to unpleasant subsidiary effects in various ways during the treatment. Even in the absence of these the patient's general condition is often rather badly affected, as shown by the more or less marked loss in weight, which may be very considerable and reach 5-10 kg. or more. When the treatment is over the patient usually quickly recovers and there is a rapid increase in weight. In a few cases we saw very

chance occurrence cannot in this case be absolutely excluded.

Results of the Treatment.

Passing now to the question of what effect we observed in the patients we treated, it must, first of all, be stated that the experiences recorded here refer exclusively to cases of ordinary chronic lung tuberculosis—the true lung phthisis. It seems to be here that sanocrysin has its useful field, while the disease, if localised in other parts, especially the so-called surgical tuberculosis, does not appear to be affected in the same way. In a certain number of the patients the favourable effect was very striking, in others it was more doubtful, and in some it could not be detected. We will, for the present, deal specially with the first group and indicate what morbid phenomena we found to be improved after a few months' treatment. We may first cite changes in the general condition, especially cessation of the febrile or subfebrile state and accompanying weakness and asthenia, from which practically all the patients suffered a little on admission. It is, however, obvious that a subjective element enters into the estimate of the condition to a marked degree here.

Of more importance are the objective changes as revealed by the stethoscope, particularly the disappearance of râles or an alteration in their character from the moist râles which are characteristic of fresh progressive processes to the scanty, dry, and sibilant sounds which often persist long after the processes

have become quiescent. Finally we have observed as an important sign of improvement that the expectoration, which originally contained bacilli, continues to be free from them, or that all the expectoration has disappeared. On admission, the majority of our patients had an excessively large number of the bacilli in the sputum. After a few injections the numbers decreased very greatly in almost every case, and this was followed by a period when no bacilli could be found by ordinary examination while a few could be detected by the anti-formin method. Lastly, the bacilli were constantly absent in a series of examinations, and in most cases did not appear again in the months following the treatment.

Of special importance in estimating the activity of sanocrysin, however, are the changes that can be followed in skiagrams, and I should think that this is a field where a thorough study would prove very profitable for the elucidation of the rationale of sanocrysin treatment and the indications for it. In his experiments on calves Möllgaard saw the acute, chiefly pneumonic, exudative changes in the lungs disappear under sanocrysin treatment, while the miliary tubercles underwent regressive changes much more slowly. Something very similar can be observed in the clinic when one attempts to bring to light by an X ray examination the anatomical changes which take place in the lungs during the treatment. Thus the extensive and rapid changes that can be seen to take place in fresh, largely exudative (pneumonic) processes are striking. Extensive and confluent shadows in the skiagrams can be seen to clear up and disappear while the stethoscopic signs diminish and die out. But also in the mainly productive forms we have seen very pronounced changes. It must be remembered that ordinary chronic phthisis exhibits anatomically a varied picture of exudative-alveolar, more cellular-productive, and purely fibrous lesions. More or less clearing up of the shadows is a frequent and striking phenomenon in all the forms when the skiagrams are compared as the treatment gradually progresses, but at the same time signs of fibrous and cirrhotic processes become more and more evident. The striped and meshed patterns become more pronounced, while the more diffuse soft shadows decrease or disappear.

Summarising the changes seen in the X ray pictures it may be said that they are the same as occur in chronic phthisis which, with appropriate treatment, becomes quiescent and is continuously transformed into typical fibroid phthisis. All the signs of fibroid processes which we are familiar with in skiagrams of phthisical lungs become more and more marked. The fibroid stripes and interlacings quite dominate the picture. But with sanocrysin treatment all this development takes place rapidly in a few months in favourable cases, while with our previous treatment it took years to obtain a similar result.

After the experiences described one would assume that the sanocrysin treatment would be specially effective in recent, not too extensive processes, particularly of an exudative, pneumonic character. This is undoubtedly correct. It is in cases similar to these (as will be seen) that in several instances we apparently obtained at least a temporary cure when the cases were not too acute with high fever. The same does not apply, as might be expected, to the very extensive processes found in phthisical patients who for some years have had a steadily progressing lesion in the lungs, nor to the absolutely chronic cases which must be classified as mainly fibroid phthisis.

We have had little experience of the progressive, continuously febrile cases of phthisis because we regard them as temporarily less suitable for treatment with sanocrysin, but in the severe cases which only have a very slight temperature rise we have in some cases seen remarkably good results even with very extensive lesions, while other cases were not much influenced, so that the processes could not be arrested.

When good results are seen in these one to two-year-old cases of extensive lung tuberculosis they are of the same nature as in the recent cases. The stethoscopic signs diminish, marked clearing-up of the X ray picture is observed, and the general condition is improved, although the sputum still contains bacilli. Usually, however, the number of bacilli in the sputum speedily decreases very considerably and they frequently disappear for a long period, but after one or two months they have appeared again, although in diminished numbers. In cases of cavernous phthisis it is not surprising that it is difficult to rid the sputum of bacilli.

In the old cases of fibroid phthisis of several years' standing one sometimes sees very striking improvement, and in these we have frequently seen the bacilli entirely disappear from the sputum during the treatment. At the same time, the general condition is very markedly improved, although the stethoscopic and X ray changes in these patients are less pronounced. In one of these old cases of fibroid phthisis we have seen the bacilli appear again in the sputum after some months complete freedom from symptoms. Other cases, in spite of freedom from bacilli, continued to have a cough and bring up sputum.

The cavities demonstrated by stethoscopy and X ray pictures deserve special mention. In some cases we saw very characteristic ring-shadows form during the treatment. As is recognised, it is difficult to decide whether this is due to the cavities showing up more distinctly on account of the clearing up of the surrounding tissue, which is seen to occur simultaneously, or whether it is a question of development of a local pneumothorax. At any rate, in one case the latter was definitely present. In other cases we observed a diminution and contraction of the cavity.

Summary of Results.

Our material of tested cases is too small and too heterogeneous to give statistics of the results obtained, and we are still far from arriving at a final result. The best impression of the value of the specific is obtained by carefully watching the individual patients during the treatment.

We will, however, give an account of the results of the treatment obtained in 42 patients where the disease was so far advanced that an estimate of its effect could be formed. Eight of these must be regarded as cured in that all subjective signs of the disease have vanished; the sputum, if still present, is always free from bacilli, the râles have entirely or almost entirely disappeared, and X ray examinations show considerable changes in the way described. Most of these patients have left the hospital for several months and feel absolutely well. Another group of 17 patients has shown signs of very considerable improvement subjectively and objectively. Some of them are free from bacilli (eight), four others show only very few bacilli with the anti-formin method. Stethoscopic examination, especially, shows a marked decrease in the extent and number of râles.

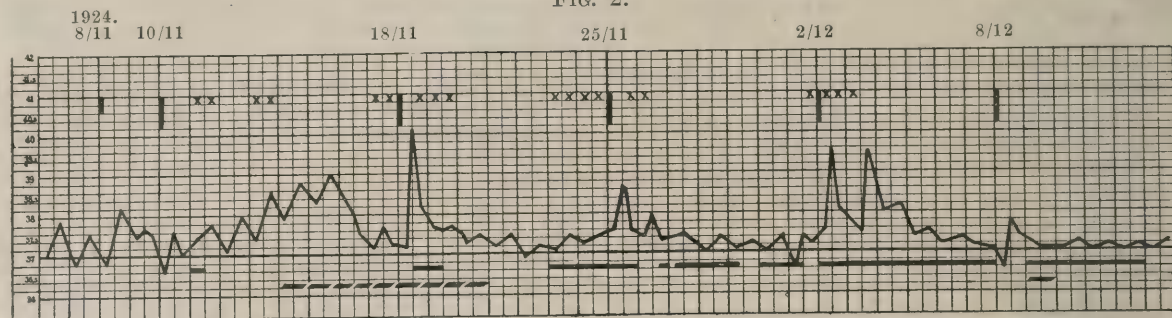
A third group comprises nine where the treatment cannot be said to have done any positive good, for after nearly six months' treatment the patients have still signs of active phthisis, which with some of them is practically unchanged and with the rest only shows signs of moderate improvement. Lastly, in six cases the disease has not been arrested by the treatment but has rather tended to spread as time went on. Two of the patients have got a pleurisy, another a tuberculous otitis media. We shall add that during the last five months we have had no deaths among the treated cases of phthisis.

As already emphasised, data such as these have, however, a limited value only. The chief point to us is whether it can be proved that the drug has a true specific action in certain cases in such a way that results can be arrived at, which it has not hitherto been possible to obtain by any other method

of treatment. In many cases improvement or a relative cure can, of course, be obtained also by sanatorium treatment or by inducing pneumothorax, but with the sanocrysin treatment we have observed take place in a number of cases such rapid and distinctly favourable changes as could not, in our opinion, have been attained in any other way.

Line, K. Cl., 26 years old. Married to a farmer. Admitted on Nov. 4th, 1924; discharged on Dec. 21st, 1924. A sister died of tuberculosis of the lungs when the patient was 5 years old. Another sister had tuberculosis of the lungs 30 years ago but is now well. The patient was healthy until nine months ago, when she got cough, weakness, night sweats, and fever. Tubercle bacilli were demonstrated in the sputum. There was hoarseness now and again.

FIG. 2.



The thick horizontal line indicates albuminuria; the thick perpendicular line, injections of sanocrysin, 0.5 g. given on Nov. 8th and 1.0 g. on the subsequent occasions; the crosses, injections of 20 g. antitoxic serum; and the interrupted line, rash.

According to our experience the cases best suitable for treatment with sanocrysin are cases of phthisis where the infection of tuberculosis has appeared in the course of the last year. In reality we have in 65 per cent. of such cases been able to observe good results, and all the really cured cases belong to this group. Much more uncertain are the results in the very frequent cases of older and extensive disease, and especially when they are in a feverish and progressive phase of the disease.

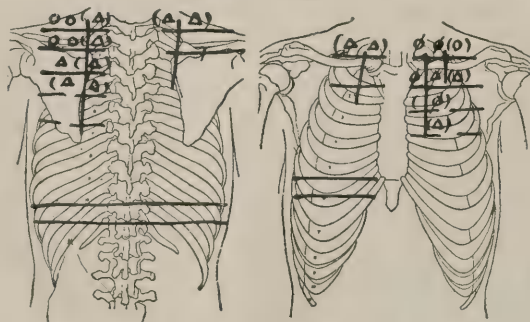
Of course, one must be prepared to find that there are many cases where no benefit can be derived from the treatment, and also that the treatment will prove injurious in some cases when used without caution. In patients who have had marked signs of phthisis for some years it will often be questionable whether the disadvantages and length of the treatment do not outweigh the benefit which can be expected to ensue. As, however, we have seen quite astonishing improvement in some cases of this type the indications for sanocrysin treatment cannot as yet be laid down with any degree of certainty.

Condition on admission.—General condition good. Temperature on Nov. 5th, 37.9°–37° C.; on the 6th, 37.6°–37°; on the 7th, 37.9°–36.8°. Appetite good; slight cough; sputum scanty; T.B. present. Urine: no albumin; hæmoglobin, 82 per cent. Height, 156 cm. Weight, 50.5 kg. Stethoscopic examination on Nov. 4th:—Left lung: In almost all the upper half there were signs of active disease; dullness, bronchial breathing, and numerous fine and medium fine, mostly moist, râles. Right lung: In the supraclavicular and supraspinous regions there was a slight dullness, bronchial breathing, and fine, moist râles on coughing.

Treatment with sanocrysin. No serum injection until after the second dose. Six injections consisting of a total of 5.5 g. Nov. 8th, 0.5 g.; 10th, 1 g.; 18th, 1 g.; 25th, 1 g.; Dec. 2nd, 1 g.; 8th, 1 g. The temperature is recorded in curve (Fig. 2).

Stethoscopic examination after termination of the treatment on Dec. 21st, 1924. Left lung: Dullness unchanged over almost all the upper half, but only bronchial breathing in the supraspinous region and in the front of the chest to the second rib. The râles had disappeared very considerably in numbers and in extent, and were now heard only in the supraspinous region and as far as the second rib in front. No moist râles, but only dry and partly dry ones were now heard only on coughing. Right lung: Slight dullness over

FIG. 3.

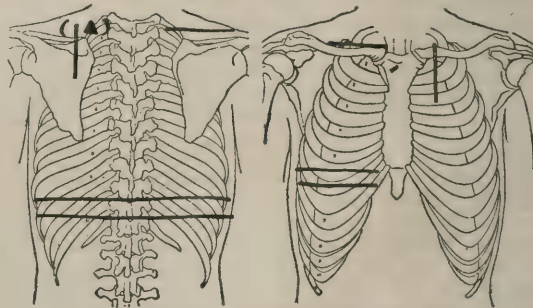


Radiological examination, Nov. 11th, 1924.

A Successful Case Narrated.

We add the history of a clinical case. Our intention is only to show that sanocrysin can really exercise a specific action. Not until later on can the final results and the indications for the treatment be determined. It is probable also that the method may be further developed so as to extend its sphere of usefulness and to avoid the inconveniences and dangers which are still attached to it.

FIG. 4.



Radiological examination, Jan. 16th, 1925.

apex as on admission, bronchial breathing over apex in front without râles, and bronchial breathing behind in supraspinous region accompanied by a few partly dry, medium-fine râles with the first cough.

Weight: On Nov. 4th, 50.5 kg.; on 11th, 51.7 kg.; on 22nd, 50.5 kg.; on Dec. 7th, 48 kg.; on 16th, 47.7 kg. The urine contained up to 3 per cent. albumin periodically. Last trace on Dec. 13th (Fig. 2).

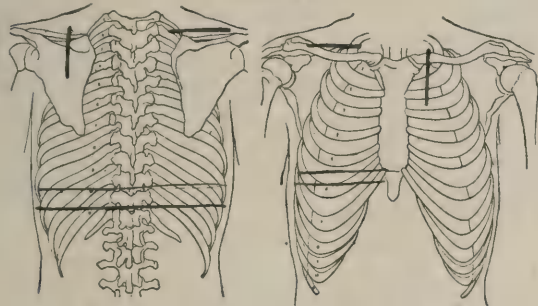
Only a few bits of sputum. Latterly only a single mucopurulent pellet every three or four days. On Nov. 8th, T.B. +; on 25th, T.B. +; on Dec. 9th, T.B. -; on 17th,

T.B.—. Pirquet reaction: On Nov. 21st, +; and on Dec. 18th, +. General condition on discharge excellent. No more weakness. Temperature normal.

Twenty-five days later was again in hospital from Jan. 15th to 25th, 1925. General condition continued to be good. Temperature normal. No albuminuria. No cough or expectoration. On stethoscopic examination on Jan. 16th only a few dry râles were heard on coughing in the left supra-spinous region, otherwise there were no râles. There was no longer bronchial breathing at left apex. Bronchial breathing at right apex over clavicle and spine of scapula. On Jan. 24th practically no râles could be heard.

The skiagrams (represented schematically in Figs. 3, 4, and 5) showed a shadow composed of patches partly

FIG. 5.



Radiological examination, Jan. 24th, 1925.

arranged in groups in the upper two-thirds of the left lung, and some retraction of the apex of the lung. On the right side there was diffuse darkening of the apex. After the cure the skiagram showed that both apices had cleared up, and, on the whole, only indefinite and rather doubtful changes were present.

The patient came in with subfebrile phthisis which had produced symptoms for nine months. A stethoscopic examination showed signs of fresh tuberculosis in the upper half of the left lung with numerous fine, moist râles. In the right apex there were a few fine, moist râles. During the treatment the râles disappeared gradually and on discharge, seven weeks later, there were only some scanty, dry, and medium dry râles in the left apex and a few in the right. Twenty-five days after discharge only a few râles were heard in the left apex and a week later none at all. The bronchial breathing in the left apex had also disappeared, but there was still bronchial breathing over the right clavicle and spine of the scapula. General condition was excellent. The weight increased, and a month after the treatment was started bacilli could no longer be found in the sputum. The X ray examination showed a clearing up of the shadows at the apices in conformity with the stethoscopic investigation. The patient must be regarded provisionally as cured by the treatment.

Conclusions.

From our present knowledge I think we can formulate the following preliminary conclusions about the sanocrysin treatment: (1) Sanocrysin has a specific curative action on tuberculosis of the lungs. (2) It does not seem to have the same effect on extra-thoracic localised tuberculosis (surgical tuberculosis, meningitis, &c.). (3) It is very effective on fresh tuberculosis of the lungs that has been manifest less than one year. (4) In older cases the effect of the treatment is uncertain. (5) It is difficult to use it in febrile cases, but some good results may be obtained in old cases of apyretic fibrous phthisis. So far it has not been able to cure acute lobar tuberculous pneumonia. (6) In ordinary cases a treatment lasts three to four months. (7) Generally the dangers may be avoided when the treatment is carried out in the right manner and with caution. (8) The antitoxic serum has a curative effect on acute shock. Its effect in preventing albuminuria is not clear, and further investigations are necessary.

CHOLECYSTOGRAPHY IN ITS APPLICATION TO THE DIAGNOSIS OF CHOLECYSTIC DISEASE.*

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DURING the last 15 months more than 1100 patients have been examined at the Mayo Clinic by cholecystography. The sodium salt of tetrabromphenolphthalein and that of tetraiodophenolphthalein were used, and each salt was administered orally and intravenously.

Sodium-tetrabromphenolphthalein: Intravenous Administration.

One hundred and seventy-eight patients were given sodium-tetrabromphenolphthalein intravenously. The patients were hospitalised and kept under strict dietetic regimen during the period of examination. The dye was given in a standard dose of 4.5 g., dissolved in 40 c.cm. of triple distilled water, sterilised for 15 minutes in a boiling water-bath and cooled for use. It was administered in two equal portions one-half hour apart, and injections were made slowly, from five to seven minutes being consumed. The median basilic vein was used when possible. Rontgenograms were made as a routine at the fifth, eighth, and twenty-fourth hour after giving the dye.

Notwithstanding the precautions mentioned, more than half the patients experienced systemic reactions in varying degree. In most cases the symptoms were trivial, but in 10 per cent. the reaction was marked and in 2 per cent. severe. The typical severe reaction began within five or ten minutes with a sense of uneasiness, followed by pain in the dorsal and lumbar region, flushing of the skin, and a rise of from 10 to 50 mm. in blood pressure, followed within three to five minutes by a sharp fall. With the fall of blood pressure, patients sometimes had intestinal cramps, nausea, vomiting, or incontinence of the bowel and bladder. Milder reactions were characterised by flushing of the skin, slight pain in the back, and transient nausea. Occasionally a delayed reaction developed four or five hours after injection.

Normally, with this test, as Graham first pointed out, the gall-bladder will retain sufficient dye to cast a shadow at the fourth or fifth hour after administration. This shadow attains its greatest intensity some time between the eighth and twenty-fourth hours, becomes progressively thinner thereafter, and usually disappears between the twenty-fourth and forty-eighth hours. The shadow is regular in contour and homogeneous. It varies in size and is commonly larger at earlier than at succeeding hours. Abnormal responses include failure of the gall-bladder to fill with the dye, persistent faintness of the shadow, delayed filling, marked delay of emptying, deformity of contour, unvarying size of the shadow, and mottling, or central defects.

Thirty-nine patients of this series were operated on. All proved to have disease of the gall-bladder, and 25 also had stones. In 19 of the 25 cases with gall-stones the gall-bladder failed to fill with the dye; shadows of the gall-stones themselves were visible in only six cases of the 19. Dye entered the gall-bladder in six cases, but in two of these the shadow was mottled with transparencies; in one the denser shadow of stones was seen within that of the gall-bladder; and in one the gall-bladder was faintly depicted at the eighth hour only. In only two cases of the 25 could the findings be construed as negative. A definite lesion of the gall-bladder without stones was found at operation in 14 cases. In eight of these the gall-

* Abstract of a paper read at the Section of Radiology, Subsection Diagnostic Radiology, International Congress of Radiology, London, July 1st, 1925.

bladder failed to fill with the dye. Its shadow was visible at the twenty-fourth hour only in one case, and at the fifth and eighth hours only in two others. No abnormalities were observed in the remaining three cases.

Sodium-tetrabromophenolphthalein: Oral Administration.

The bromine salt has been given orally to more than 800 patients. No preparation of the patient is required. The dose is proportioned to the body-weight and ranges from 4 to 7 g. It is given in ordinary gelatin capsules containing a gramme or a half gramme each. The patient is instructed to take the capsules at intervals during the evening meal, drinking water freely, and present himself without breakfast for the examination next morning at 8 o'clock. Rontgenograms are made at the twelfth, fifteenth, and twentieth hours after the dye is taken.

Reactions following oral administration of the bromine compound have been relatively few and never grave. Occasionally complaint has been made of nausea, a few patients have vomited, and in rare instances catharsis has occurred. Shadows of the gall-bladder obtained by the oral method are commonly less dense than those observed after intravenous administration. In about half the normal cases the shadow disappeared by the twentieth hour. Otherwise the principles of interpretation and the distinctions between normal and abnormal responses to the test are the same for both methods.

One hundred and forty patients of this series have been operated on. At operation 71 patients were found to have gall-stones. In 36 cases of this group no shadow of the gall-bladder had been seen; shadows of the stones were evident in seven of the 36. A faint shadow of the gall-bladder was noted in 15 cases. Mottling of the shadow by stones was observed in 15 cases. In five cases the response to the test was normal. Marked disease of the gall-bladder, without stones, was discovered at operation in 33 cases. In 16 of these the gall-bladder had failed to cast a visible shadow with the dye, and only a faint shadow was seen in 11. In five cases the rontgenological findings were considered to be normal. The third group comprised 17 cases in which the gall-bladder when removed revealed pathological changes of minor degree. At the rontgenological examination the gall-bladder had failed to cast a shadow in seven and responded normally in ten. In the fourth group of 19 cases the gall-bladder was explored in the course of operation for other lesions and adjudged to be normal. No abnormality had been discovered at the rontgenological examination in 16 of them. In three cases no shadow of the gall-bladder was visible.

Sodium-tetraiodophenolphthalein: Oral Administration.

Sodium-tetraiodophenolphthalein was given orally to a limited series of patients. The standard dose was 0.08 g. for each kilo of body-weight, but not in excess of 6.6 g. to a patient. Both enteric-coated pills and plain gelatin capsules were tried. Almost all the patients who received the pills experienced purgation, vomiting, or nausea. These disturbances occurred less often from the capsules, but more frequently than from the bromine salt. Rontgenograms were made at the same periods and under the same conditions with respect to fasting as in the oral method with the bromine salt, and the same criteria were applied in interpretation.

Up to the present 25 patients have been examined with the iodine salt by mouth. Three have been operated on. All three had given normal responses to the test. In two cases the gall-bladder was accounted to be normal on surgical exploration in the course of operation for other lesions. In the third case the gall-bladder was removed, but only minor pathological changes were found.

Sodium-tetraiodophenolphthalein: Intravenous Administration.

Patients to whom the iodine salt was given intravenously were not hospitalised, but were subjected to the same dietetic regimen as those who received the bromine salt intravenously, and rontgenograms were made at the same periods. A dose of from 3 to 3.5 g. was given, dissolved in 28 c.cm. of triple distilled water, and administered at one sitting. Preparation of the solution was identical with that of the bromine salt. No reactions occurred, and this was ascribed in part to exceptional purity of the drug. The shadows obtained were somewhat denser than those obtained with the bromine salt.

This series comprised 32 patients, of whom 11 have been operated on. Three of these patients had gall-stones; in two cases there had been no shadow of dye in the gall-bladder, and in the other the shadow was mottled. Five patients had marked cholecystitis without stones; in three the gall-bladder had not been depicted with the dye, while in two the shadows were normal. Slight disease of the gall-bladder was discovered in three cases; in two the rontgenological examination had been negative, and in the third case the shadow was faint.

Rationale and Weight of Signs.

Among the cholecystographic phenomena indicative of disease, failure of the gall-bladder to fill with the dye in sufficient quantity to cast a shadow seems to rank first in frequency and to be unexcelled in diagnostic value. Scarcely less reliable is constant faintness of the shadow. Potential causes of complete absence or persistent faintness of the shadow are of two types—namely, those which interfere with entrance of the dye-laden bile into the gall-bladder, and those which interfere with concentration of the bile. A stone obstructing the cystic duct or a large volume of stones, sand, or abnormally thickened bile in the gall-bladder should mechanically exclude or impede entrance of bile carrying the dye. Empirically, at least, this association has been found repeatedly. Swelling of the mucosa of the duct, spasm, or constricting adhesions would logically also have this effect.

Cirrhosis or other grave disease of the liver might hamper excretion of dye in the bile and thus lead to an error of interpretation, but I have encountered no such instance. It is difficult to appraise the effect of hepatitis alone because many other factors are involved and it is a common accompaniment of cholecystic disease. Rosenthal's experiments tend to show that the liver has a large "factor of safety" and that extensive damage is required to impair hepatic function. At all events, in some cases of this series, in which hepatitis and cholecystic disease were associated, the gall-bladder was normally visualised.

An increase of intensity followed by a diminution is the usual normal finding. This definite order is hardly to be expected always, as it may possibly be modified by the drug used, the method of administration, variation in the period of rontgenography, or failure of the patient to comply with directions as to taking food. Mottling of the shadow demands some caution in interpretation. When produced by stones which are denser than the dye there is little chance of error. Mottling due to transparent cholesterol stones is sometimes fairly characteristic in appearance. In many instances, however, the shadow-defects are not markedly different from those caused by gas in an overlying segment of bowel, and this source of error must be guarded against. Papillomas, if of sufficient size, should also produce mottling.

Unvarying size of the shadow at all periods may be construed as evidence that the gall-bladder lacks normal elasticity. If, however, the intensity of the shadow varies and is fairly pronounced at any time, unchanging size loses force as an index of disease, and one would hardly venture to base a diagnosis on this sign alone.

By all the methods described the normal gall-bladder seldom fails to cast a shadow on the first films made. After intravenous administration of the dye a shadow usually remains at the twenty-fourth hour. After oral administration the gall-bladder may or may not be empty of dye by the twentieth hour. Differences between the food regimen of the two methods probably account for the disagreement. Moderate delay of filling or emptying, or acceleration of either may have a significance which will be learned with experience. At present one is obliged to construe such minor abnormalities with reserve.

Local deformities of contour were rarely observed in this series. In one case a slight flattening of the fundus seemed unrelated to the pathological changes found at operation. In another the fundus was very pointed, but the gall-bladder was deemed to be normal on surgical exploration. Adhesions about the gall-bladder were present in several cases, but no deforming effects on the shadow were noted, although such a possibility is obvious.

Apparently least significant of all factors is the position of the gall-bladder. In persons of the slender habitus it is usually situated low and mesially, while in those of the broad habitus it is likely to be placed high and laterally.

Errors of Diagnosis.

The affirmative diagnoses of disease appear to be well sustained, and there were few disappointments in the series. Negative findings with the dye tend to be somewhat less reliable. Occasionally a definitely diseased gall-bladder will respond normally to the test. Even the shadow of a gall-bladder containing stones may sometimes have normal characteristics in general. The most serious obstacle to the accuracy of a negative diagnosis is the gall-bladder in which are only minute pathological changes, probably a residue from more pronounced disease in the past. Such a gall-bladder more often responds normally to cholecystography and may be apparently normal on surgical exploration. If the history warrants its removal, it will seldom fail to reveal at least microscopic evidence of disease.

Comparison of Methods.

Intravenous administration of the dye offers advantage in superior control of the patient, certainty that the specified dose of the drug has been given, and emphasis of the shadows obtained. Its disadvantages are the requirement of a punctilious technic and the hazard of local or systemic reactions. With identical technics the bromine salt given intravenously seems to be more provocative of systemic reactions than the iodine salt, if the latter is pure.

Simplicity and freedom from grave reactions are the principal advantages of oral administration. With either salt, nausea and purgation ensue occasionally. The iodine combination, even when pure, seems to produce these discomforts more often than the bromine. Vomiting after taking either drug, unless early, has apparently had no material effect on the shadow. Dye in the intestinal contents produces shadows which may be a little confusing and might possibly conceal the shadow of the gall-bladder, but such circumstances are infrequent. Lack of certainty that all of the drug has been taken as directed is another minor objection. The question may also arise as to whether defective absorption from the intestine may not be a cause of abnormal findings. However, all these objections and doubts seem to have little basis, for in this series the diagnostic results from all methods have been about equal.

From these considerations it will be apparent that my present preference is for the oral use of the bromine salt as a routine, and the iodine intravenously to check doubtful cases.

ANURIC DIABETIC COMA.

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THE exact cause of diabetic coma is still doubtful, but it is regarded as the end-result of acidosis and due, directly or indirectly, to the accumulation of acetone bodies in the blood. All the authorities take this view though they recognise various clinical varieties. For instance, Tidy¹ gives three types: (1) Dyspnoeic; (2) alcoholic; (3) a type with collapse. Osler² gives a somewhat similar classification. Even Joslin³ in his classical book regards acidosis as the essential factor in diabetic coma, although he speculates about two cases with anuria which obviously fall into the renal or anuric type which I am about to describe. Graham⁴ goes a step further and describes two main types—viz., with well-marked hyperpnoea and without obvious hyperpnoea—but does not show the essential differences between the two types. MacLean⁵ admits that it is possible to have diabetic coma in which the tests for acidosis give practically normal results, but he draws no distinction between the nature and course of the disease in these cases and in the ordinary acidosis cases.

Clinical Types of Coma.

Until the advent of insulin it did not much matter how one classified cases of diabetic coma—practically all were fatal. With the aid of insulin, however, the cases of ordinary, frank diabetic coma usually responded to treatment in a marvellous way, but very soon one was discouraged to find that certain patients died in spite of the new treatment. I noticed that the patients who died were those who had little or no acidosis, and as far back as December, 1923,⁶ I recognised two distinct types: (1) ordinary type associated with acidosis, which, as a rule, recovered with insulin treatment; and (2) type with little or no acidosis ("post-operative type"), all of whom died in spite of the most energetic treatment. I recorded three cases at that time and since then I have had five others, four of whom died. Thus out of eight cases of this type seven have died. With the help of Dr. Milligan and Dr. Lindsay, my house physicians, to whom I am greatly indebted, the cases were observed very closely and we found that with insulin treatment any slight acidosis present was easily abolished, the urine was rendered sugar-free, and the blood-sugar was brought down to normal limits. Instead of corresponding clinical improvement, however, the patients became worse, and they secreted less and less urine until there was complete anuria before death.

In all these cases there was some albumin in the urine and usually a few casts. The concentration of urea in the urine was usually low and in the blood invariably high; in one case it reached 206 mg. per 100 c.cm. There was seldom noticeable thickening of arteries or high blood pressure. Most cases were of some standing, but one, a young man, gave a history of only two to three weeks' illness. The blood-sugar was always very high. Clinically, the most prominent symptoms were vomiting, restlessness, and feeble, quick pulse. The type of respiration varied, sometimes Cheyne-Stokes, never typical air-hunger. Little or no smell of acetone in the breath, but the tension of the eyeballs was lowered as in coma of the ordinary type. Sometimes there was quiet delirium, but never twitching of muscles or epileptiform convulsions. Usually some amount of consciousness was retained till very shortly before death.

Cause of Anuric Type of Coma.

What is the cause of the coma in such cases? It cannot be acidosis, neither can it be the mere excess of blood-sugar, for as great an excess may be present without coma; and, moreover, the blood-

sugar may be reduced to normal with insulin and yet no improvement result. It is possible that the essential cause is the production of some unrecognised toxin resulting from the faulty metabolism in diabetes. Whatever the primary cause, it soon became clear that the immediate cause was some kind of defective action of the kidneys. Two constant features were very high blood-urea and diminished secretion of urine, ending in complete anuria. The natural suggestion then was that the coma was due to uræmia, but against this were the facts that beyond slight albuminuria many cases showed no evidence of inefficient kidneys up till the onset of coma, while the symptoms were different from those commonly found in uræmia. They resembled much more the symptoms of so-called urinæmia, found in obstructive suppression of urine, in which the severe and acute mental disturbances, the sudden amaurosis, and the epileptiform phenomena in general of uræmia are lacking.

We had opportunities of doing post-mortem examinations in several cases, and my thanks are due to Dr. A. F. S. Sladden and Dr. Milligan for their help in this connexion. Certain changes were found which suggest that the kidney is an all-important factor. Dr. Milligan is at present engaged in a research on this question which I am sure will be of great value.

Prognosis and Treatment.

Meanwhile, it is very desirable that these cases should be recognised clinically. First for prognosis. If a patient in diabetic coma shows abundant glycosuria with high blood-sugar and high blood-urea, absent or slight ketonuria, but with a trace of albumin in the urine, the prognosis is very grave. Up till a short time ago I would have said that it was hopeless, as my first seven cases all died, and this in spite of all kinds of treatment for the suppression of urine in addition to the ordinary treatment of diabetic coma. Recently, however, I have had one case which recovered. The only difference in the treatment of this case was that two pints of normal saline were given subcutaneously *at the outset*, and four pints more were introduced during the first 24 hours. Whether this was the determining factor in recovery is, of course, doubtful, but as it is the only case which has recovered, I would advise this treatment being carried out at once in any similar case. Of course, all the other cases had saline administered, but the rectal route was usually tried first before resorting to the subcutaneous or intravenous method, and possibly valuable time was thus lost. It is important, therefore, both for prognosis and treatment, that this variety of coma should be recognised as soon as possible and the most energetic treatment given without delay. This warning is the more necessary, as cases of this kind often appear to be of less severity than the ordinary cases associated with marked acidosis.

Summary.

To summarise, the points common to both varieties of coma are: (1) Drowsiness going on to coma; (2) vomiting (usually) and constipation; (3) lowered tension of eyeballs; (4) raised blood-sugar; (5) glycosuria; (6) tendency to heart failure.

The differences between the two types are:—

Ordinary Diabetic Coma with Acidosis.—(1) Blood: Blood-sugar moderately high; blood-urea about normal. (2) Urine: Good quantity and soon increases with treatment; much acetone and diacetic acid; no albumin (usually). (3) Clinical: Coma usually deep some time before death; air-hunger marked; odour of new-mown hay in breath. (4) Prognosis: Insulin treatment usually cures.

Diabetic Coma with Absent or Slight Acidosis.—(1) Blood: Blood-sugar very high; blood-urea very high. (2) Urine: Usually small quantity going on to complete anuria; little or no acetone or diacetic acid; some albumin. (3) Clinical: Coma often not deep till just before death; air-hunger absent

or slight; no odour of new-mown hay in breath. (4) Prognosis: Usually fatal from anuria.

Whether this type of diabetic coma without acidosis is a distinct entity is doubtful, as some of the cases began with the typical signs of ordinary diabetic coma, and it was only when the acidosis had cleared up under treatment, without corresponding clinical improvement, that they showed themselves to be of the definite anuric type described above. Be that as it may, it is certain that as regards symptoms, physical signs, course and prognosis, it is a distinct clinical type and that the immediate cause of death is suppression of urine.

The condition might be called diabetic coma of the renal type, but until further knowledge is gained the most suitable name would appear to be "anuric diabetic coma." This has the advantage of emphasising the outstanding symptoms of the disease and the one for the relief of which all our energies have to be directed.

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THE TECHNIQUE OF SPLENIC PUNCTURE IN THE DIAGNOSIS OF KALA-AZAR.

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SPLENIC puncture, as a means of clinching the diagnosis, is essential in kala-azar. By some this procedure is regarded with a certain measure of apprehension on account of the risk of lacerating the splenic capsule and thereby causing intra-peritoneal hæmorrhage. I am convinced that, if the patient is partially anaesthetised and the exploration needle is sufficiently sharp and of correct calibre, little or no danger is to be apprehended. The patient should receive 1/100 gr. atropine about half an hour before the puncture is to be performed, and the skin over the costal margin should be infiltrated with 1 per cent. novocaine solution. The entry of the needle through the abdominal wall and the piercing of the peritoneum will thereby be rendered to a great extent painless, with the result that the patient will not flinch or suddenly retract the diaphragm, a movement which is liable to lacerate the splenic capsule. The needle employed should be of a bore sufficient to admit of a plug of splenic tissue, but should not be so stout as actually to lacerate the pulp. (Allen and Hanburys' No. 10 size I find to be the most suitable; this needle is also of the correct length—40 mm.)

Considerable difficulty may be experienced in obtaining microscopic preparations free from aspirated blood comprising mostly pulp cells containing the Leishman-Donovan body. For this purpose the plunger of the aspirating syringe should not be driven home to the extremity of the barrel, but an air space of 1 cm. at least should intervene. Traction on the piston must be steadily kept up directly the needle is ascertained to have entered the organ, and aspiration must cease directly blood can be seen entering the barrel of the syringe.

On retraction of the syringe the aspirated tissue and blood is blown out on to a clean microscopic slide and examined in a darkened room by means of an electric pocket torch (the "Ever Ready" being the most suitable for the purpose). The light being held underneath the drop, the portions of spleen pulp can be easily demonstrated like small grains of sago floating in the blood-stained fluid. These particles of tissue are then picked out by means of a

fine platinum loop and spread upon clean slides. Preparations of splenic pulp cells are thereby obtained, in which the parasites can be demonstrated without difficulty by means of Leishman's stain.

In a splenic puncture recently undertaken the success of this measure was remarkable. The resulting films consisted of a mass of splenic endothelial cells, few red blood corpuscles being visible in the preparation.

Reviews and Notices of Books.

PATHOLOGY AND BACTERIOLOGY OF THE EYE.

Second edition. By E. TREACHER COLLINS, F.R.C.S., Consulting Surgeon to the Royal London Ophthalmic Hospital; and M. STEPHEN MAYOU, F.R.C.S., Surgeon to the Central London Ophthalmic Hospital. London: W. Heinemann. 1925. With 4 coloured plates and 306 figures. Pp. 731. 42s.

THE authors of this work have long been recognised as authorities on ocular pathology, and the present edition embodies chiefly the results of their own researches, excellently illustrated by figures, many of them reproduced from original papers in the Transactions of the Ophthalmological Society.

The first chapter on aberrations in development is divided into five sections in which the various abnormalities that are met with are traced to their respective periods of origin in embryological history. Incidentally, we find some interesting explanations of some not uncommon clinical appearances—e.g., the so-called shot-silk or watered-silk retina, pseudo-optic neuritis, and the congenital crescent that is sometimes found and which has nothing to do with myopia. On the subject of congenital colour-blindness the authors profess themselves on the side of those who attribute it to some, at present unascertained, aberration in the cones. Chapter II., on neoplasms, includes figures and descriptions of various uncommon forms of cysts. Chapter III., on disturbances in the circulation and constitution of the nutrient fluids of the eye, deals with arterial and venous obstructions, hæmorrhages, and serous effusions. It also explains the mechanism of normal intra-ocular tension, and deals with the problems connected both with glaucoma and with diminished intra-ocular tension or hypotony, to which subject Mr. Collins has given special attention. In Chapter IV., on injuries, special interest attaches to the explanation of the condition known as "commotio retinae," following a contusion of the eyeball without rupture of its coats. The drawing of a microscopical section shows a subchoroidal hæmorrhage compressing the capillary layer of the choroid. If the blood is absorbed soon circulation in the choroidal vessels is re-established and the retinal functions are regained; if, on the other hand, it is long in being absorbed, the rods and cones atrophy, the pigment cells become visible, and sight is permanently impaired. Chapter V., which has been largely rewritten, deals with inflammation—in the first place the changes common to all inflammatory processes, and in the second the modification of the general processes of inflammation in the various structures of the eye. Chapter VI. deals with parasitic diseases affecting the eye, bacteria, fungi, and animal parasites, *Spirochaeta pallida* being classed under the third heading. Under a fourth—diseases which are probably but not certainly due to micro-organisms—are included trachoma, vernal catarrh, and sympathetic ophthalmitis. In Chapter VII., dealing with degenerations, various forms of cataract are dealt with, and under the heading of neural epiblastic degenerations is included retinitis pigmentosa, in accordance with the theory held by Mr. Collins that it is actually caused by an abiotrophy of the retinal cells. An appendix on laboratory methods completes the book.

This work does not pretend to be encyclopædic or final. There is, for instance, no reference to those

concussion injuries to the eye caused by bullet wounds of the orbit described by Lagrange, and the authors have not attempted to include all the findings of slit-lamp microscopy of the living eye, a study which is as yet in its infancy. Within its self-imposed limitations, however, the work is a thoroughly sound one, and we recommend all ophthalmic specialists to become familiar with it.

CHEMISTRY IN THE SERVICE OF MAN.

Third edition. By ALEXANDER FINDLAY, M.A., D.Sc., F.I.C., Professor of Chemistry, University of Aberdeen. London: Longmans, Green and Co. 1925. Pp. 309. 6s.

Prof. Findlay belongs to that small group of scientists who are able to write for both the advanced student and the lay reader. The work has been enlarged and three new chapters have been added. The first of these deals with radio-activity. Here the author traces the growth of the present-day theories with regard to the constitution of matter. Dalton, in 1803, taught that the atoms were solid, undividable bodies, but even so early as 1816 Prout was led to suggest that the atoms of different elements were all built up of some primordial substance which he called protyl. Prout put forward this theory on account of the atomic weights of the elements being, in most cases, whole numbers. This theory did not receive much support until Mendeléeff described the periodic law. The next line of approach came through the study of electrical discharges in vacuo, and from these two sources the present ideas of the structure of the atom is evolved. Confirmatory evidence was obtained by studying the properties of radium. The second new chapter is on the rare gases of the atmosphere. Here are described the experiments leading to the isolation and identification of argon, krypton, and allied gases. The third addition deals with metals and their alloys. Here the author considers the methods available for the preparation of these bodies from their ores, and their properties and alloys. Prof. Findlay describes the interesting condition known as "tin plague." He points out that under 18° C. ordinary lustrous tin is unstable and changes into a semi-porous state known as grey tin. If the temperature is very low these changes can take place fairly rapidly, resulting in marked disfigurement of any article made of the metal. A plate is included showing a seventeenth century medal suffering from "tin plague," which completely spoils the otherwise dignified appearance of one Balthasar-Bekker.

In the main, the rest of the work has been left unaltered. Certain sections have been revised and some rewritten. The style and choice of subjects are admirable, and Prof. Findlay is to be congratulated upon the appearance of this third edition of a charming book.

ELEMENTS OF COLLOIDAL CHEMISTRY.

By HERBERT FREUNDLICH, Fellow of the Kaiser Wilhelm Institute of Physical Chemistry. Translated by GEORGE BARGER, F.R.S., Professor of Medical Chemistry in the University of Edinburgh. London: Methuen and Co., Ltd. 1924. Pp. 210. 7s. 6d.

Prof. Freundlich's work upon adsorption and other colloidal problems is well known. It is mainly for his work on the mathematical aspect of adsorption that he is famous. Freundlich's adsorption equation has become an accepted scientific fact. It will therefore come as a cheering surprise to the general reader that not a single mathematical deduction is included in this little book. The main body of the work consists of a condensed form of the author's larger book, "Kapillarchemie," which has become a standard work on colloids. The volume is divided into two main sections, the first of which sets out the physico-chemical foundations of colloidal chemistry. After an interesting introduction the author deals with capillary chemistry—i.e., the changes occurring at interfaces. This method of attacking the problem

of colloids is essentially Teutonic, and this volume is certainly one of the first to be published in the English language in which colloidal chemistry is presented in the form of capillary chemistry. The author considers the events taking place at the interface between liquids and gases, two liquids, a solid and a gas, and finally between a solid and a liquid. By this means the whole of the field is covered, and the first section concludes with two articles on capillary-electrical phenomena, and the problems of interfacial layers. In the second section the author deals with colloidal systems as a whole. Thus the properties of sols, gels, mists, and smokes, and the like are considered.

There are perhaps one or two points which might be criticised. Little or no reference is made to the work of J. Loeb on adsorption in relation to the iso-electric point of proteins. In the second place, it is possible that the author has been too drastic in eliminating all mathematical considerations. A simple mathematical treatment of adsorption would certainly have assisted some students in grappling with larger works.

In the translator's note Prof. Barger says: "I was so impressed by the manuscript of Prof. Freundlich's 'Grundzüge der Kolloidlehre,' that I at once undertook its translation." We have to compliment Prof. Barger, firstly, upon his judgment, and, secondly, upon his ability as a translator.

THE BACTERIOLOGY OF FOOD.

By CUTHBERT DUKES, M.D., M.Sc., D.P.H.,
Lecturer in Bacteriology, King's College for
Women. London: H. K. Lewis and Co., Ltd.
1925. Pp. 180. 7s. 6d.

Dr. Dukes has produced a readable little book which contains much information not hitherto available in a collected form, although it may be found scattered through the pages of larger works. The volume is likely to be appreciated by the students for science degrees, for whom it is primarily written, and it may also be read with profit by both medical and D.P.H. students who are too often content with those aspects of bacteriology which are directly relevant to pathology. About a half of the book is devoted to milk and its products, and perhaps other foodstuffs suffer a little by contrast, but both water and alcoholic beverages receive adequate attention. We consider that the direct search for tubercle bacilli in milk is really a waste of time and energy, and that since Dr. Dukes evidently only teaches on the subject as a concession to ancient usage, he might omit the section. There is a mistake on p. 57 where the virulence test for *B. diphtheriae* is described as being made by the injection of a "serum slope" into guinea-pigs. The correct practice is to use broth cultures.

AN INTRODUCTION TO SEXUAL PHYSIOLOGY.

By F. H. A. MARSHALL. London: Longmans,
Green and Co., 1925. With 72 text figures (some
coloured). Pp. 167. 7s. 6d.

The conventional text-books of physiology generally contain a most inadequate account of the working of the sexual apparatus, and the average student would probably be pained and surprised if he was asked some very simple questions about it. The truth is that the answers to some of these simple questions—why do the breasts hypertrophy during pregnancy, what brings pregnancy to an end, what determines the sex of a child and so forth—have been and in some directions still are quite obscure, and their discussion has been hampered by a mingling of fact and fancy which is unknown in those departments of physiology of less urgent human interest. Since the publication of Dr. Marshall's "Physiology of Reproduction" (with a second edition in 1922) it has been easy to learn what is known on the subject and, which is perhaps more important, to appreciate what is not known and how many ordinary things need investigation. In this country he has made the topic his own, and he now

increases our indebtedness to him by publishing a short and simple version which should have a wide circulation. It is intended "for biological medical and agricultural students," is well illustrated (thanks, we suppose, to the existence of the larger book) and cheap, and gives an admirable account of the sexual cycle, pregnancy, lactation, and the influence of the sex-glands, fecundity and the related problems; determination of sex is also discussed. The writing is clear and straightforward. The tangled sentence on p. 131, "the fact that the free-martin and its partner are not derived from the same egg is definitely negated by there being two corpora lutea," is an exceptional muddle which a new edition will correct, and the difficult task of abbreviating a systematic book seems to have been done very well. We cordially commend the book for itself and as an introduction to the fuller account.

BRONCHIECTASIS.

Traitement Chirurgical de la Dilatation Bronchique.
By Dr. P. GUIBAL. Paris: Masson et Cie. 1924.
Pp. 173. Fr. 10.

The surgery of the lungs and bronchi has not received in France the attention it has long enjoyed in the U.S.A. and Germany. It is to make good this defect that Dr. Guibal has written this little book which deals with such operations as artificial pneumothorax, thoracoplasty, pneumotomy, ligature of the branches of the pulmonary artery, lobectomy, and partial pneumectomy, as far as they concern bronchiectasis. It is disappointing, but not surprising, to find how ineffective many of these procedures are for this disease. An artificial pneumothorax may rid the patient of all his sputum as long as the injections of gas are continued, but soon after the lung is allowed to re-expand the bronchiectatic state returns. Extrapleural thoracoplasty may be a good palliative remedy in cases of bronchiectasis which are mainly unilateral, but, according to the author, complete recovery can never be achieved in unilateral cases of diffuse bronchiectasis operated on according to Sauerbruch's technique. An interesting account is given of such daring operations as lobectomy, the mortality of which is from 40 to 50 per cent.—a high risk justified only by the desperate prognosis of many cases left in the hands of the physician. This book is a useful introduction to the subject and it does not claim to be more.

THE TEMPORAL BONE.

L'Os Temporal chez l'Homme Adulte: Iconographie et Description de l'Os et de ses Cavités. By PHILIPPE BELLOCQ. Paris: Masson et Cie. 1924. Pp. 128. Fr. 18.

This monograph, written by Dr. Bellocq, on the results of his personal investigations of a large material, is an excellent example of the clearness in description which is so frequently a marked characteristic in French anatomical works. Like most of these, it is written from the surgical or pathological standpoint more than from that of the morphologist, and deals first with the bone as a whole, subsequently treating of the connexions of its constituent parts, the details of each of these parts, and the various cavities contained in the structure. The descriptions are excellent, clear and reliable, and are aided by good figures in line, so that—to the anatomist at any rate—there is no break in the continuity of interest and description. It may be, however, that the purely descriptive standpoint is not the best possible one for the non-anatomical reader when he begins to study the details of the temporal. The bone is the most complex portion of the skeleton, built up by the fusion of parts derived from distinct and separate planes and regions, and it would seem better to give such a reader a mental picture or conception of the bone made up in this way as a preliminary to his detailed study, and a guide to his comprehension of the medley of facts into which he is plunged. This view may be prejudiced, it might perhaps be held to be fallacious.

but it does not, at any rate, keep us from the expression of sincere admiration for this descriptive account of the bone; any clinician who has to do with the temporal bone, and feels that he would like to improve his acquaintance with it, can be advised to procure this book and some sectional bones, when he should have little difficulty in attaining his object.

INTELLECTUAL DEVELOPMENT AND THE ERECT POSTURE.

By WM. COLIN MACKENZIE, M.D., F.R.C.S., F.R.S.E., Director of the National Museum of Australian Zoology, &c. Melbourne: Allan Grant. 1924. Pp. 41.

THIS little book has been written in support of Dr. Mackenzie's belief that the assumption of the upright position is the most important factor in the evolution of the human species, that this is inherently a question of muscular development, and that the degenerations and diseases to which the unfortunate human being is prone are mostly to be credited to his failure to keep his muscular system going in the proper way. We have been disappointed with the book. Whether Dr. Mackenzie's creed will stand examination or not could hardly be determined by study of such a small work, but it cannot be said that he has carried out the intentions expressed in his opening pages. The mere account of certain differences in the comparative anatomy of living mammals does not in itself constitute an evolutionary argument. In many respects the little work is an interesting one to read, and in many ways suggestive.

PRACTICAL CHEMISTRY BY MICRO METHODS.

By EGERTON C. GREY, D.Sc., F.I.C., M.R.C.S., Professor of Chemistry, Government Medical School, Cairo. Cambridge: Heffer and Sons. 1925. Pp. 124. 4s. 6d.

THE author has written a text-book of analysis for medical students in which white tiles are substituted for test-tubes. Reactions are also performed on slides, and the results may be observed by means of a small microscope or by a pocket lens. It is thus possible to conduct a complete course of analysis with great economy. All teachers are aware of the liberality of medical and other elementary students with reagents. A whole set of reagent bottles may be emptied during the analysis of some simple solid. By means of the techniques outlined in this book it would be impossible for the student to waste his reagents. The idea of micro-analysis for elementary students is not a new one, since it has been employed extensively in technical schools and similar institutions in this country for some time. Teachers speak well of the method, and Prof. Grey's book should prove of great value to all engaged in teaching analysis to these students.

TUBERCULOSIS.

Les Processus Naturels de Guérison de la Tuberculose Pulmonaire. By Dr. JAQUEROD. Paris: Masson et Cie. 1924. Pp. 121.

A SOUND knowledge of the physiology and pathology of the lungs invaded by the tubercle bacillus is surely essential to any scientific attempt to cure pulmonary tuberculosis. It would not be necessary to repeat this platitude were it not for the ambitious tendency of human beings to try to run before they have learnt to walk, and to try to cure evils before their causes are known. Dr. Jaquerod's book is a painstaking protest against this tendency as it appears in the field of therapeutics, and throughout the pages of his book his main thesis is that we must penetrate into the secrets of cure by Nature if we expect, in common phrase, to "go one better than" Nature. With a background of 20 years of specialising in pulmonary tuberculosis, he teaches this among other lessons: Give Nature time. Translated into more definite terms, his opinion is that at least a year is required for the clinical recovery of a case of pulmonary tuberculosis. And, as life for the ordinary human

being is "the maintenance of an equilibrium always threatened," it behoves the consumptive to regard his own particular equilibrium as very unstable. All of which is plain, but apt to be disregarded as too obvious to be constantly borne in mind.

Concealed Tuberculosis or "The Tired Sickness." A Clinical Study upon the Exhaustion Type of Hidden Tuberculous Infections. By GEORGE DOUGLAS HEAD, B.S., M.D. Philadelphia: P. Blakiston's Son and Co. Pp. 137. \$2.00.

THE author of this book has made a discovery. It is that many persons who complain of symptoms commonly traced to neurasthenia are suffering from a tuberculous infection which is the cause of all their troubles. Now, this is a discovery which every intelligent physician makes, and one is inclined to ask: Why write a book about it? The gist of the author's thesis is summed up in two of his sentences. "This slow-burning fire of a low-grade tuberculous infection manifests itself in such an insidious manner as to escape detection by the usual clinical methods of diagnosis. . . . This type of tuberculosis fails of recognition unless the specific tuberculin tests are used." There follows a plea for the subcutaneous tuberculin test which the author has never known in his own practice to disseminate tubercle. Yet he has been using Koch's old tuberculin subcutaneously since 1895. Such immunity to tuberculin disasters is extraordinary.

DISORDERS OF THE VENOUS SYSTEM.

Entzündung, Thrombose, Embolie und Metastase im Lichte neuerer Forschung. Von Prof. Dr. PAUL VON BAUMGARTEN, in Dresden. München: J. F. Lehmanns. 1925. Ss. 208. 7s. 7d.

CONTAINING little in the way of original observations or new conceptions, this book is a compendium of most that has been thought or written on the subject. For such books there is a distinct place, but the usefulness of this particular one will, unfortunately, be somewhat limited for English readers by the author's peculiar style. It may appear presumptuous to criticise the literary construction of a foreign author, but Dr. Baumgarten's habit of including adjectival subclauses within each other surely passes the limits allowable even in the language in which he writes.

DISEASES OF THE EYE IN CHILDREN.

Die Augenerkrankungen des Kindesalters in ihrer Besonderheit. By Dr. L. HEINE, Professor and Director of the University Eye Clinic at Kiel. Berlin: S. Karger. 1925. With nine illustrations. Pp. 52. M.3.

THIS small volume is written for the benefit of those practitioners who, without being eye specialists, possess sufficient skill in the use of the ophthalmoscope to make its employment a routine measure in appropriate cases, and desire to be able to treat all ordinary cases of eye disease in children not requiring operation. Among the useful points that they will find here, and which they would not find in ordinary text-books of children's diseases, are that infants affected with blepharospasm at birth, when the cause has been removed and they can open their eyes, may appear to be completely blind for some weeks, especially in cases of malnutrition. The disease known as kerato-malacia, which is found in badly-nourished infants, is, we are told, extremely rare in Schleswig-Holstein, although in Hesse and Silesia it is not uncommon. With regard to optic atrophy and neuritis, the author tells us very truly that it is by no means easy to make a confident diagnosis in children from a single examination with the ophthalmoscope. In young children the disc may be very pale or grey without the presence of any degree of optic atrophy. On the other hand, cases of apparent or "pseudo-" neuritis are sometimes seen in children when the condition is purely physiological. The author cites a case in which he himself was inclined to diagnose a

true neuritis until he discovered the same anomaly in other children of the same family. Most ophthalmic surgeons have had more or less similar experiences. The subject of refraction is only lightly touched on, but what is said is, broadly speaking, sufficient for the practitioner who does not specialise on the eye. We miss any instruction as to special precautions to be taken in the case of myopic children and as to the advice to be given to parents. With this exception the little book is as complete as it can be made in the small space that the author allows himself.

APPLIED ANATOMY.

Sixth edition. By GWILYM G. DAVIS, M.D. Revised by GEORGE P. MÜLLER, M.D. London and Philadelphia: J. B. Lippincott Company. 1925. Pp. 638. 42s.

Davis's "Applied Anatomy" has been a well-known and well-studied text-book for many years. The untimely death of Prof. Davis has led to the production of this edition by the present Professor of Clinical Surgery in the University of Pennsylvania. There has been a considerable amount of new matter introduced, and operative descriptions have been brought up to date where required. The illustrations remain a great feature of the book, and some can be termed beautiful. It may be pointed out that the surgeon who, in Fig. 254, is manipulating the right arm of a supine subject, does not seem to be interested in the fact that this limb carries at its extremity a left hand.

The book is beautifully got up, and there is no doubt that it will continue to be a favourite work of reference.

ANTHROPOLOGY.

Measurements, Weights, and Other Facts Relating to Man. By J. F. TOCHER. Edinburgh: Oliver and Boyd. 1924. Pp. 172.

THIS volume of anthropological statistics from Scotland contains the second and third reports of the William Ramsay Henderson Trust. The first, published in 1905, was an anthropometric survey of the inmates of lunatic asylums in Scotland; the object of the Trust in preparing the present volume was to ascertain whether or not the asylum populations could be regarded as fair samples of the general population in this respect. Observations have therefore been made on the population of the north-eastern region of the country and on soldiers drawn from all parts of Scotland. The results obtained show that the insane populations represented the total population very adequately. The volume is essentially one for the specialist; it manifests the elaborate patience and care that all such surveys demand, and will take its place with the similar records that modern biometric schools are steadily producing against the day when there shall be sufficient accumulation to provide a basis for really valuable statistical deductions on a large scale.

Human Constitution. A Consideration of its Relationship to Disease. By GEORGE DRAPER, M.D., Associate in Medicine at Columbia University, New York. London and Philadelphia: W. B. Saunders Company. Illustrated. Pp. 345. 37s. 6d.

THIS volume is a collection of comprehensive anthropometrical statistics showing the relation between human morphology and disease. Dr. Draper has for some years been collecting data at the Constitution Clinic in the Presbyterian Hospital of New York and has enlisted the help of anthropological and anatomical specialists. He claims that his method is more accurate and more inclusive than those hitherto employed, and that all victims of certain diseases show pronounced morphological features in common. The diseases considered here are gastric

and duodenal ulcer, gall-bladder disease, nephritis, hypertension, pernicious anaemia, tuberculosis, and asthma. There is a definite tendency at the present time for workers in all parts of the world to attempt to correlate bodily structure with pathological diatheses. The practical application of such data, if further research confirms the presence of a recognisable correlation, is not yet apparent, but it is easy to speculate on further advances in preventive medicine if it becomes possible to tell from biometric investigation of the school-child or youth what mental or physical aberrations he is likely to develop. This volume must await confirmatory evidence before its value can be appraised.

A Short Course of Physical Anthropology. By M. R. DRENNAN, M.B., F.R.C.S.E., Professor of Anatomy in the University of Cape Town. Cape Town: The S.A. Electric Printing Co., Ltd. 1924. Pp. 43. 5s.

THIS little book was written primarily for the students of anatomy of the University of Cape Town, to relieve them from the tedium of note-taking, and its scope "coincides with the limited syllabus which is at present prescribed for the anthropological part of the anatomy course and examination." Prof. Drennan deserves congratulations on the excellent little compilation he has made, wherein a great number of facts and views are given shortly but clearly. The volume can be recommended as a guide or note-book in any department in which a course in physical anthropology is taken, and its modest price puts it well within the reach of students.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The thirty-fifth meeting of the Commission was held in Edinburgh on June 30th, Prof. Alexander Gray in the chair. Evidence as to the provision of dental treatment for insured persons was given by the East of Scotland Dentists Panel, represented by Mr. Ernest Miller and Mr. William Arbuckle. Mr. William Thomson, secretary of the Scottish Coöperative Friendly Society, gave evidence as to the desirability of extending the scope of medical benefit and providing dental and other treatment benefits for insured persons, and also as to various matters in connexion with the administration of benefits by approved societies. Mr. John Reid, representing the chartered accountants of Scotland, gave evidence as to the audit of accounts of approved societies, and urged that this work should be entrusted to chartered accountants in general practice rather than to a special Government audit department. Mr. Matthew Reynard, clerk to the Association of Parish Councils of Scotland and clerk to the Glasgow Parish Council, gave evidence as to the relations between health insurance benefits and Poor-law relief. Mr. T. J. Addley, secretary of the Scottish Professional Assistants' Society, and Mr. R. Williamson, secretary of the Independent United Order of Scottish Mechanics, gave evidence on behalf of the Edinburgh, Leith and District Friendly Societies' Council. The thirty-sixth meeting was held at the Home Office, Whitehall, on July 2nd, Lord Lawrence of Kingsgate in the chair. Evidence as to the work of the British Social Hygiene Council was given by Mr. E. B. Turner, Dr. Otto May, Dr. P. A. Clements, and Mr. Leonard Bowden. The Cambridge-shire Tuberculosis After-care Association, represented by Dr. P. C. Varrier-Jones and Mr. F. Bunnett, submitted evidence on the need for special benefit arrangements under the Insurance Scheme for persons suffering from tuberculosis. Similar evidence was given on behalf of the London County Council by Mr. G. H. Walmisley. The National Council of Agriculture, represented by Mr. James Donaldson and Mr. Denton Woodhead, gave evidence as to the undesirability of pooling the Insurance funds of societies. Thereafter the Society of Apothecaries, represented by Dr. A. D. Brenchley and Dr. Reginald Wall, and the Association of Certificated Dispensers, represented by Mr. Graham Bott and Mr. A. Wager, gave evidence as to the qualifications of the holders of the Society's certificate for Insurance dispensing. Volume I. of the Minutes of Evidence covering the period from Oct. 16th, 1924, to Jan. 8th, 1925 (the first to twelfth days inclusive), is now on sale at H.M. Stationery Office, price 10s. 6d. Part II. of the appendix to the minutes, containing the statements submitted by certain approved societies, insurance committees, dental societies, representative bodies, &c., on which the oral examination was based, is also on sale, price 10s. 6d.

THE LANCET.

LONDON: SATURDAY, JULY 11, 1925.

THE STATE OF PUBLIC HEALTH.¹

THE annual Report for the year 1924 of the Chief Medical Officer to the Ministry of Health, Sir GEORGE NEWMAN, appears this week, being the sixty-seventh of a series presented annually by his predecessors and himself as medical advisers to the Privy Council, the Local Government Board, and the Ministry of Health respectively. The Report follows the precedents of the previous official records, and enables us to get an all-round view of the state of public health in this country, not only for the period covered by the details and statistics, but also in regard to a continuous policy and a progressive planning. The information and advice which it proffers alike to the Ministry and to the local public health authorities include the classified figures required year by year to estimate the state of public health, special references to particular diseases where the circumstances during the year has made them of interest, and notes of investigations undertaken with the object of obtaining fuller knowledge of prevalent scourges. The Intelligence Service of the Ministry now collects and disseminates information from home and foreign sources, and the medical information bureau thus constituted continues to increase in usefulness with the growing accumulation of tested, sifted, and collated experiences. In view of the frequently expressed opinion by semi-scientific speakers and writers that cancer research makes no progress, or that the mystery of cancer lies wholly in some dietetic faults, we recommend our readers to note the nature of the inquiries made already, or now progressing, under the Cancer Committee of the Ministry of Health.

The fundamental data of the physical life and health of the people in England and Wales during 1924 show, as for many previous years, a declining birth-rate, and while this is not balanced by a declining death-rate it is compensated for by the infantile mortality-rate. The death-rate of infants under one year of age per 1000 born during 1924 was 75, a figure which is translated for us in the Report as signifying that during the year in question the country saved 39,000 babies' lives over and above the average annual saving recorded during the decade 1901-1910. The great movement typified by the promoters of Baby Week, the activities of which are noted elsewhere in this issue, is bearing very definite fruit, and the fact that the figures of 1924 do not compare favourably with those of 1923 is an incident accounted for by the attacks of measles. The influence of epidemic infections on the population during 1924 present the special feature that among the mortality-rates there are found exceptional declines under the heading of small-pox, scarlet fever, and enteric fever. But the returns of the notifiable infectious diseases show

marked increase of the epidemic disorders of the nervous system, encephalitis lethargica being particularly to blame. Pneumonia also was more prevalent than at any time during the last five years, and many more cases of small-pox occurred, though the mortality-rate was low, as it was in the case of enteric fever. Of these two epidemic inflictions, Sir GEORGE NEWMAN says frankly that, as they are controllable directly or indirectly, "their occurrence in epidemic form is almost culpable." In the year 1924, 3850 cases of small-pox were notified in England and Wales under the Infectious Diseases Notification Acts, and 32 other cases were reported, most of them coming to notice when local outbreaks of the disease were under investigation. Of the notified cases, only 85 were subsequently withdrawn on a revision of diagnosis, showing that with prevalence of the condition ability to detect it becomes much wider spread. Eight of the cases in this large total were fatal, though in Derbyshire alone 1351 cases were notified, and there were 650 cases in Yorkshire, and over 500 and 400 in Nottinghamshire and Northumberland respectively. In the County of London only four cases of small-pox occurred throughout the year, notwithstanding the very large number of persons from all parts of the country who visited the metropolis to attend the British Empire Exhibition at Wembley. Indeed it is one of the most striking features of the disease that London should remain so immune. In connexion with the mildness of the type of small-pox that has been prevalent recently we obtain from Sir GEORGE NEWMAN a clear pronouncement on the policy of making no difference in nomenclature and procedure under the Infectious Diseases Notification Acts as between small-pox and "mild small-pox." He enunciates, as a sound principle, that any specific disease should be notified as that disease, whether the attack be severe or mild.

There is valuable advice to the public in one of the final conclusions of the Report, its gist being that the public should be urged to use existing facilities devised by the Ministry of Health and provided by the medical profession for the maintenance of proper standards of health. Opportunities should never be missed to put before the public the pressing need that exists for the coöperation of public action in the promotion of preventive medicine. The columns of the more influential lay papers give this message day by day to enormous constituencies, but that vast progress which might be secured by the employment of medical knowledge and facilities now available is not made sufficiently prominent, and the education of public opinion is not sufficiently orderly. All the figures for the last half century go to prove the success which has attended scientific intervention in overcoming insanitation. This is so far public information that no one is found to-day who would suggest that the money spent in providing a good water-supply or in protecting child-life is other than well spent; and yet in many directions similar opportunities for overcoming disease are neglected. The public does not as yet choose to exercise to the full powers for the prevention of disease which are provided, and criticism of these or scepticism as to their efficacy is not well dealt with. The reasoned arguments of medicine will always be regarded by a certain school of thinkers as the outcome of professional selfishness—that odium we can bear quite lightly; but the reasoned arguments of laymen who speak with justified authority are not sufficiently credited as outweighing inchoate, uninformed or sentimental views—that is a national loss.

¹ Annual Report of the Chief Medical Officer to the Ministry of Health for the Year 1924. H.M. Stationery Office. 1925. 3s. 6d. net.

X RAY DOSAGE.

THE extensive use of X rays in the treatment of disease has brought about the necessity of measuring the dose administered in terms of a definite unit. A great amount of valuable work has been done at different institutions all over the world in the application of X rays to medicine, but hitherto, on account of the absence of a unit of measurement, it has been impossible to correlate the results and progress has greatly suffered in consequence. Undoubtedly the most urgent need of the radiologist at the present moment is a means of accurately measuring dosage. The first step towards this is the establishment of an X ray unit in terms of which he can compare the results of other investigators with his own. This was emphasised during an interesting discussion on International Units and Standards for X Ray Work, which took place at the International Congress of Radiology held last week at the Central Hall, Westminster—and reported in another part of this issue—when representatives from all parts of the world were present. The subject was considered from the physical as well as the biological aspect. The discussion was opened by Sir WILLIAM BRAGG, F.R.S., chairman of the British X Ray Unit Committee, who dealt with the physical nature of the problem, and he was followed by Dr. BÉCLÈRE, of Paris, who spoke from the standpoint of the radiologist.

Up to the present several units have been employed and confusion is likely to arise if the number of these units is allowed to increase. Already in this connexion the same letter "R" denotes two totally different quantities. Consequently the first step towards the settlement of the problem is to decide upon a definition of the unit which should be universally employed in all countries as a basis for the measurement of dosage. The unit which has found most favour is the electrostatic unit suggested as early as 1908 by the French physicist VILLARD. This unit may be expressed as the quantity of X ray energy which produces an amount of electricity equivalent to one electrostatic unit in passing through one cubic centimetre of air at 18° C. and 760 mm. Hg. Certain factors have to be considered when making this measurement, the chief of these being that all the energy dissipated in the volume of air considered is actually taken into account and that no extraneous effects interfere with the measurement. An absolute unit of this nature has an advantage over other units that have been suggested, in that the dose is independent of the apparatus employed for its measurement. Uniformity of measurement is therefore obtained apart from any particular experimental arrangement. Having fixed upon the unit, the next step is to calibrate in terms of this unit the different instruments employed for measuring dosage. In Germany the above unit has been employed for some time and instruments intended for medical practice have been calibrated at a number of centres situated in different parts of the country. The representatives reported that this scheme had proved quite satisfactory, an X ray dose being reproducible at any time in the various clinics. There are, however, certain precautions to be taken; for instance, it is essential to specify the quality of the radiation, as differences are observed when radiations of different penetrating powers are employed. In practice it has been found necessary to calibrate the instruments for a limited number of radiations of different quality. The establishment of the physical unit and the calibration of the dosimeters fall within the province of the physicist, and they can be carried out to a greater degree of accuracy than is required

for practical purposes. Moderate accuracy will suffice, as the measurement of the dose, under practical conditions cannot be made with a high degree of precision. The correlation of the indications of the dosimeter and the biological effect is the work of the radiologist. This presents some difficulty because only a fraction of the energy absorbed by the tissue will be biologically active. A good deal of research will have to be done on the biological side to determine this fraction. It is well known that the X rays which are scattered by tissue play an important part in the irradiation of deep-seated cancer. The intensity at a depth shows considerable variation according to the disposition of the apparatus and patient and the experimental conditions at the time of treatment. To obtain any degree of precision, the conditions of irradiation must be carefully stated. For instance, the size of the field irradiated, the voltage of the X ray tube, the distance from and the nature of the target. All these factors—and there may be others—should be noted when measuring dosage. Prof. WINTZ, of Erlangen, emphasised the importance of standardising these conditions so that results may be directly comparable.

To arrive at a complete solution of the problem the radiologist and the physicist must work in close coöperation. Already in this country and in Germany there exist X ray unit committees which have done valuable work in connexion with this all-important question of dosage. It is worthy of note that both these committees arrived quite independently at the same conclusion regarding the adoption of the electrostatic unit. It is likely that several methods will be employed to measure the unit, so that it will be necessary to check the calibration of an instrument in one country against that in another country. It is urged that an X ray unit committee be formed in each country and that these committees should keep in close touch with each other. It was resolved at the close of the discussion at the Congress that an international committee be formed to discuss the matter further, with a view to arriving at a scheme which will be universally adopted. Such an international committee, which will consist of both physicists and radiologists, will perform an important function and, as the result of its deliberations, it is hoped that research on the effect of radiation on human tissue will be greatly facilitated.

THE TASTE FACTOR IN DRINKING WATER.

THE British Waterworks Association held its annual meeting in London last week and discussed various aspects of the water-supply. Sir ALEXANDER HOUSTON, Director of Water Examination to the Metropolitan Water Board, submitted a paper on the Purification of London's Water-Supply. The greater part of his communication was devoted to the problem of taste, since it is insufficient to produce a water bacteriologically safe; consumers expect also to be supplied with a water free from objectionable taste. There are two kinds of taste liable to occur in town waters, chlorinous and iodoform. The former can always be avoided by correct dosage or by de-chlorination, the latter is unaffected by such de-chlorinating agents as sulphurous acid and sulphites. It has been known for a long time that phenol in extremely minute doses reacts with chlorine in water to produce this extremely unpleasant iodoform taste. ADAMS¹ has recently shown

¹ THE LANCET, May 23rd, 1925, p. 1093.

that 1 part of phenol in 1000 million parts of water is sufficient to produce taste and that there are sufficient phenol impurities in the atmosphere of towns to supply this proportion. Water authorities using chlorination must therefore protect their water from atmospheric air as well as from fog, mist, rain, and any liquid pollution liable to contain any trace of phenol. In spite of all prophylactic measures, taste troubles may still occur and must be combated. RACE, RIDEAL, HAROLD, ADAMS, HOUSTON, and others have devoted much study to this important question. The three chief substances that act as preventers of taste in water are organic matter, potassium permanganate, and ammonium compounds.

In the United States and Canada chlorination is nearly always practised after filtration, and it is possible that taste troubles would be avoided by using the chlorine before filtration. Slightly larger doses are required, but the extra expense is almost negligible. During the last eight years 70-80 million gallons of Thames water have been chlorinated daily before filtration, and no complaint of taste has been received from the two million consumers. Potassium permanganate was first used by HOUSTON in 1913 to remove a taste due to *Tabellaria*, and later, with equal success, in connexion with the New River chlorination treatment. The usual dose is 1 in 5 millions, and with waters of surface origin the pink tinge disappears within a few minutes. Unfortunately, however, it persists even with a smaller dose in the case of deep well waters containing hardly any oxidisable matter, thus rendering such treatment practically inadmissible. Permanganate has the advantage that it may be added before, with, or after the chlorine with equally good results. Laboratory experiments seem to show, however, that it cannot be used before filtration if chlorination is to be practised after. Whether or not this is due to the reabsorption of phenol bodies during the filtration process is not known. Ammonia and ammonium compounds are now being used in many places as taste preventers; apparently the first worker to use ammonia on a practical scale was RACE. The absence of colour is a great consideration, and although the cost, weight for weight, is higher than permanganate, it may be found on further study that the actual cost is less, since a smaller quantity is required and also it reduces the dose of chlorine necessary for sterilisation purposes. It seems as if ammonia, although it exercises a "lagging" effect, ultimately increases the sterilising action of chlorine. The dose of ammonia, expressed as nitrogen, required to prevent taste troubles varies in different cases, but 1 in 5 millions is an average figure. Sir ALEXANDER HOUSTON spoke of an experiment on a large scale, 45 million gallons a day, in which chlorine alone was first used in a dose of 1 in 3 millions. The percentage number of 10 c.cm. positive *B. coli* cultures was 26. When ammonia was added (1 in 5 millions) before the same dose of chlorine, the number of positives was reduced to 4.

The cost per pound of liquid chlorine, liquid sulphurous acid, permanganate, liquid ammonia, and ammonia compounds (expressed as nitrogen) is approximately as follows:—

	Pence.	
Chlorine	2.34	
Sulphurous acid	7.5	
Potassium permanganate	7.0	
Liquid ammon. (liquor ammon. fort.)	11.0	} in terms of nitrogen.
Ammonium chloride	11.1	
Ammonium sulphate	9.2	

Thus chlorine is by far the cheapest chemical, and ammonia and its compounds the most expensive.

At the same time, if very small doses of ammonia were found to be equally efficient as taste preventers, the balance might be economically in favour of ammonia. It is clear that great progress has been, and is being, made in our knowledge of the reasons why certain waters develop an iodoform taste in the presence of active chlorine, and the best and most economical ways of overcoming these difficulties. One gratifying health feature arises from these considerations. If taste troubles can be economically and certainly overcome, there will be less disposition to cut down the dose, with consequent risk of imperfect sterilisation, in order to avoid complaints from consumers as regards taste. There have been cases where the question of taste rather than of bacteriological result was the dominant factor in determining the dose of chlorine.

CONVENTION OF ENGLISH-SPEAKING OPHTHALMOLOGICAL SOCIETIES.

THE convention of ophthalmologists to be held next week in London is to be confined to English-speaking societies, but one of the subjects to be considered at a general meeting is the re-establishment of international ophthalmological gatherings on the pre-war basis. Science knows no frontiers, and it is to be hoped that the promoters of this discussion will be successful in their object. Meantime there is plenty of matter to engage the attention of the convention which is to be opened by a reception at the Royal College of Surgeons on the evening of July 13th. On the 14th, after the formal reception of delegates from the United States, Canada, and Australia, the President, Mr. E. Treacher Collins, will give the opening address on the Elimination of Eye Disease. This will be followed by the reading of papers by various members and in the afternoon by excursions to institutions of ophthalmic interest in London and its vicinity. In the evening a reception will be held at the Royal Institution of Great Britain, at which Sir William Bragg will give an address on Thomas Young and his Work. On the three succeeding days the programme is somewhat similar. Papers will be read during the day. A symposium will be held on the Evolution of Binocular Vision, in which Sir Charles Sherrington, Sir Arthur Keith, Sir Frederick Mott, Prof. G. Elliot Smith, and Prof. S. E. Whitnall will take part; Sir John Parsons will deliver the Bowman Lecture on the Foundations of Vision, and there will be a discussion on the Microscopy of the Living Eye. Sir William and Lady Lister's garden party and a reception at the Wellcome Historical Medical Museum will provide further opportunities for social intercourse, and the proceedings are to be wound up by a banquet at the Guildhall on July 17th, at which H.R.H. the Duke of Connaught is to be the guest of the convention. The organisers are to be congratulated on a programme so full of interest and variety. The meetings are to be held at University College, Gower-street, W.C. 1. On arrival in London every member of the convention is requested to attend as soon as possible at the Registration Bureau.

BETHLEM HOSPITAL SITE.—The Select Committee of the House of Lords which has had before it the Bethlem Hospital Bill authorising the removal of the asylum to the Monks' Orchard Estate on the Kent and Surrey borders, has decided that the measure ought to proceed on the ground that there is general agreement as to the desirability of the scheme. Sir Lynden Macassey, K.C., opposed on behalf of the Southwark Borough Council, which desires to keep the site as an open space, but Mr. Thomas, K.C., for the promoters, pointed out that the charity would suffer if the value of the site could not be realised. The governors, were, however, quite prepared to consult with the London County Council and to coöperate with the public authorities.

Annotations.

"Ne quid nimis."

MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MEDICAL men who visit the Museum of the Royal College of Surgeons, Lincoln's Inn-fields, will meet with evidence of great activity. During the present month a special exhibition is being given in Room I. of the Museum of all the preparations and donations added to the collection during the past 12 months. At the end of the present month the additions are assigned to their permanent places in the Museum. Of the additions just made, over 300 in number, 170 represent pathological conditions, many of which were obtained by surgeons in the course of operations. Noteworthy are the preparations added to the series which illustrates disorders of the pancreas, for which the College is indebted to Mr. J. A. Cairns Forsyth, and those which exemplify tumours of the testicle, added by Mr. H. R. Dew. Particularly numerous are the preparations which illustrate diseases of bones and disorders of their growth. Visitors have an opportunity of examining the specimens which were prepared by the late Sir William Macewen during his classical researches into bone growth. Specimens presented by Mr. Alan H. Todd show an early stage in the onset of osteogenesis imperfecta. Dr. A. E. Pinniger adds to the collection a heart ruptured by indirect violence. A negro miner, who was within the radius of an accidental explosion, was picked up dead but with no external mark of injury. At the post-mortem examination a rupture was found of the left ventricle. Another remarkable heart was given by Dr. Robert Ellis, of Taunton. It is that of a boy who died from rupture of the ascending aorta, which was the site of an aneurysmal dilatation. Beyond the dilatation was a pronounced stenosis of the aorta of congenital origin. A specimen of identical nature was presented four years ago by Dr. G. A. Sutherland. Another interesting addition is that made by Mr. Arthur H. Crook, of Eastbourne. The preparation represents the viscera of a seventh month child which lived for seven days; it shows a malformation of the lower part of the oesophagus with complete stenosis of the middle part of the duodenum. A gift by Mr. Philip J. Franklin exemplifies a very uncommon malformation—a congenital union of the vocal cords of a child aged 2 years. Lieut.-Colonel R. H. Elliot has added very valuable sections of the eye to illustrate the pathology of glaucoma and of myopia. The same donor has also enriched the series which illustrates the craniology of anthropoid apes, by presenting skulls of the peculiar form of gorilla which inhabits the Kivu forests of East Africa. Through Dr. J. B. Christopherson the College has added to this exhibition specimens prepared by Dr. Fuzinami, of Kyoto, to illustrate experimental schistosomiasis.

The President of the College, Sir John Bland-Sutton, has made donations to all sections of the exhibition now on view. Particularly interesting is a series of models, carved in wood by the curator of the museum of the Historical Society, New Bedford, Mass., to show the external form of the larger kinds of whales. The value of this series is enhanced by an evolutionary tree of the whale family which has been mounted in the same case as the models.

Besides examining the special exhibition, which represents specimens which will be allotted to all departments of the Museum, visitors will have an opportunity of examining other additions and improvements which have been recently made in the Museum of the College. A special case designed by Mr. E. C. Frere, F.R.I.B.A., has been installed in Room I. to contain the surgical instruments and personal mementoes of Lord Lister. The Army

Medical Collection is now exhibited in a spacious new room and is available for purposes of study. A special series is being brought together in Room III. to exemplify the various forms of disorder of growth to which the human body is subject. Sir Frank Colyer has set out a remarkable series of specimens to show how repair is carried out in the tusks of elephants after fracture and gunshot injury. Those interested in the portraiture of John Hunter may examine an extremely interesting portrait which, in the opinion of Sir Arthur Keith, is that of the celebrated surgeon, representing him when about his forty-fifth year. This portrait has recently been presented to the College by Mr. G. Buckston Browne. The Museum is open to all medical men and may be visited between 10 A.M. and 5 P.M., except Saturday afternoons, when it is reserved for ambulance and other classes.

THE CHALMERS MEMORIAL GOLD MEDAL.

THIS medal is awarded biennially to persons under 45 years of age for "researches of outstanding merit contributing to our knowledge of tropical medicine and hygiene." At the recent annual general meeting of the Royal Society of Tropical Medicine and Hygiene it was presented by the newly elected President, Dr. Andrew Balfour, C.B., C.M.G., to Prof. Warrington Yorke, of the Liverpool School of Tropical Medicine, in recognition of his work on trypanosomiasis, malaria, and many other subjects. Prof. Yorke read a paper on Further Observations on Malaria Made During Treatment of General Paralysis. The earlier work of Prof. Yorke and Dr. J. W. Scott Macfie on this subject was communicated a year ago and showed that induced malaria, whether as a result of direct inoculation of the blood of an infected patient or the bites of infected mosquitoes, was remarkably susceptible to the action of quinine in a dosage of 30 gr. on three consecutive days. It was further discovered that quinine has no true prophylactic action, for daily doses of 10 gr. of quinine administered for five days before, on the day of and for seven days after the infecting bite of the mosquito, did not prevent the onset of typical malaria. Similarly, 30 gr. given on the day of the bite and on each of the two succeeding days did not prevent malaria. From these results it was evident that quinine, though very efficacious for the primary attack of malaria when parasites appeared in the blood, had no action on the sporozoites injected by the mosquitoes.

Prof. Yorke's paper at this meeting dealt with the subsequent history of the cases reported on last year. The number of relapses has remained at 2 per cent. in more than 100 cases of malaria induced by inoculation of virulent blood and treated by the three-day course of quinine, from one and a half to two and a half years ago. The inoculation of the strain from man to man during three years, involving more than 40 passages, has not produced an increase in virulence or any morphological variation in the parasite itself. Where the infection had been induced by the bites of mosquitoes, with a similar course of treatment, 21 out of 37 patients relapsed, two in the first month, two in the second, one in the third, and the rest from the fourth to the eleventh months. The late development of these relapses is in marked contrast to the experience of the war, when the vast majority of relapses occurred within six weeks of cessation of treatment. Of the 21 relapses, fever disappeared in the majority of cases either spontaneously or as a result of a second short course of quinine. These results are very different from those obtained during the war, and it does not appear that the amount of quinine or the manner of its administration, the period of the year when an infection or treatment occurs, or the strain of parasite can explain this outstanding difference; the only factor which can reasonably account for it is the individuality of the patient. This factor appears to be the one which determines whether a relapse will occur and, if so, when. On the subject of the mechanism of the action of quinine, Prof. Yorke

could see no reason to alter the opinions expressed in the communication made last year. Quinine destroys large numbers of the malarial parasites, the broken-down bodies of which act as an antigen to stimulate the production of antibodies which, if present in sufficient amount, bring about a sterilisation of the infection and the cure of the patient. Some evidence has been obtained that the drug acts indirectly in destroying parasites, certain body cells coöperating with the quinine in producing a substance directly toxic to the parasites. The use of large doses and prolonged courses of quinine is not advocated; the best method of treating malaria is to deal with the attack with a few moderate-sized doses and await developments; if relapses occur, repeat the treatment and maintain the general health by diet and avoidance of exhaustion, for relapse depends on the reaction of the patient himself and his capacity to develop immune body.

ANTHROPOLOGY AND PREVENTIVE MEDICINE.

THE fact that certain persons are more liable than others to contract or to succumb to certain diseases must have been known from the earliest days of observation, but the science of immunology is of recent birth and has not yet found an answer to the fundamental question as to why A is happy in immunity while B is not. The facts and experiments concerning racial and species immunity at present recorded form a tangled skein of unrelated and unexplained threads for the unravelling of which the help of the anthropologists is needed. For this reason Lieut.-Colonel J. Cunningham, I.M.S., himself the son of a distinguished anthropologist, chose as the subject of his paper before a recent meeting of the Royal Anthropological Institute "Some Factors in Racial Immunity." India is peculiarly suited for a study of the problems of race immunity since peoples of totally different genealogy, diet, habits, and sanitary standards are there encountered living side by side under identical environmental conditions. Among the observations on record are those of Dr. Agnes Scott on osteomalacia, the incidence of which she found to correspond with the *purdah* system or, in more general terms, with any area where the women live sedentary, secluded, and unhygienic lives. Colonel Cunningham himself has noted the limitation of kala-azar epidemics in Kayalpatnam, S. India, to the Mohammedan community. These, being traders, came in contact with infected towns, but never communicated the disease to the segregated Hindu agriculturists living in the same village. He has also investigated the relation between climatic conditions and dysentery in certain gaols of Southern India. The largest peak in the chart of dysentery incidence was found to correspond with the summer rains, while two lesser peaks indicated relapses occurring at the onset of the hot and cold weather respectively. In fact, the cases of acute attack could be correlated with the sudden changes of temperature accompanying thunderstorms. An example of species immunity is seen in the reaction of rodents to anthrax, the rat being almost immune, the guinea-pig and mouse extremely susceptible, while the rabbit is less so. The racial variation in susceptibility to tuberculosis is strikingly seen in the incidence of the disease in the French Army of occupation, the figures per 1000 being: French 9.5, Moroccans 11.7, Arabs 13.3, Annamites 15.3, and Senegalese 86.1. Modern tests, such as the Calmette and von Pirquet reactions, the Schick test for diphtheria, and the Dick test for scarlet fever, provide an accurate method for estimating natural immunity. On Thursday Island 96.8 per cent. of the population were found to be susceptible to diphtheria. Rose Carter has shown that the supposed immunity of the negro to yellow fever is really a case of susceptibility to toxin rather than to micro-organism, so that the death-rate is definitely less among negroes than among white men, although it is doubtful whether the incidence differs greatly.

It has been stated that the European in India is much more liable to intestinal disorders than the native, but 25 per cent. of the natives are infected with dysentery and the apparently greater liability of the white man may be accounted for by his unwitting contact with infected servants. The original claim that native races showed a relative immunity to cancer has been modified in recent years, and the latest statistics tend to show that it is only the particular variety of malignant growth that varies from race to race. The Chinese are especially liable to carcinoma of the stomach and to an epithelioma of the hip, due to sleeping on the hot *k'ang*, and Eastern races generally suffer from a primary carcinoma of the liver that takes the place of Western intestinal cancer. The Javanese show a high percentage of malignancy of liver and uterus. The importance of the factor of exposure to infection, personally or racially, has not yet been adequately assessed. Negro races that have only recently come into contact with civilisation manifest a very high tuberculosis mortality with low morbidity, while those that have been long associated with the white man show figures similar to Western statistics. In Colonel Cunningham's opinion there is no evidence of true racial immunity in man, comparable to that seen in animals, but the coöperation of anthropologists and immunologists is required in the further investigation and interpretation of the facts obtainable.

ICE-CREAM AND SCARLET FEVER.

Dr. A. Mearns Fraser has reported to the Portsmouth Health and Housing Committee on an outbreak of scarlet fever arising from infected ice-cream. Up to the last week in May there was no undue prevalence of scarlet fever in Portsmouth, but on May 29th 21 notifications were received, on May 30th 21, on May 31st 14, on June 1st 8, on June 2nd 6, on June 3rd 1, and on June 4th none. Altogether there were 83 notifications in five days. It was soon noted that the common feature was the consumption a day or two previous to the attack of ice-cream made by a firm of dairymen and sold at various branch shops. On May 30th a medical practitioner notified eight patients who had attended a whist drive and were at first thought to be suffering from food poisoning. They had partaken of ice-cream at the whist drive. Three assistants at the branch dairy shops were among those notified. Ultimately it was found that all the ice-cream was made by a man and a boy at one of the branch shops. The boy went home ill on the night of May 29th and was diagnosed as scarlet fever on May 30th. It was stated that the boy had a sore-throat, which he did not mention, for a week before going off work. Apparently the rash was not noticed until the night of May 29th. There were no cases of scarlet fever among the customers who only consumed milk supplied by the dairy, and after full consideration of the facts Dr. Fraser concludes that the ice-cream was infected by the boy and that none of the other three employees at the other branches was in any way implicated. The dairy firm gave every assistance in the investigation and were quite unaware of the fact that the boy was indisposed during the week previous to his definite attack. The outbreak fortunately was of a mild type. A feature, which has been observed before in the case of milk outbreaks, was the shortness of the incubation period in many of the cases. Another noteworthy feature was the early stage of the illness at which the boy was able to infect the milk. Again, it has been common to a number of other milk epidemics that the symptoms of the apparent infector have frequently been obscure. Dr. Fraser is not aware that scarlet fever outbreaks have ever been traced to ice-cream before, although enteric fever outbreaks from this source are on record. A noteworthy example of the latter occurred a few years ago in the South Shields rural district. The ice-cream in the Portsmouth case was made of cream custard and eggs in an

electrically worked freezing machine. The boy's job was to pack the ice-cream into tins for distribution and then take it round to the various branch shops. The outbreak ceased abruptly on the stoppage of the sale of the ice-cream. It is difficult to see how such outbreaks can be entirely prevented. The present one cannot be attributed to negligence, and a daily medical examination of all persons employed in handling milk is hardly feasible.

TREATMENT AT MENTAL HOSPITALS.

RECENT reports of mental hospitals, of which some abstracts appear on another page, show the trend of modern mental treatment in public institutions. There is a steady movement towards treatment as opposed to bare maintenance. Committees and medical officers are realising that the difficulty of restoring the *mens sana* offers no reason for neglecting to furnish a *corpus sanum*. Dietaries are everywhere being overhauled to see where they can be improved and their caloric and vitamin content made adequate. Butter is taking the place of margarine and nourishing and palatable items are being added to the menus. Specialist services are being enlisted to remove any source of bodily disability or focus of sepsis, and nearly all mental hospitals now have a dental surgeon attached to the regular staff. The absence of a pathological laboratory is a stigma that every committee is anxious to remove and the research carried on by the expert pathologist should in the long run afford a sound basis for treatment. Perhaps the most important person connected with the mental patient is the nurse, who comes into intimate contact with him in all his moods; in the past the mental nurse has often been drawn from the least trained members of the profession. Now a steadily increasing number are being urged to obtain general training in addition to working for the nursing certificate of the Medico-Psychological Association. The nursing public is beginning to understand that mental nursing is the highest branch of service, demanding gifts which cannot be overestimated. The Commissioners of the Board of Control are urging on mental hospitals the importance of allowing to patients individuality of costume and providing useful occupation in some form of trade or handicraft. A few hospitals have appointed special instructors whose therapeutic as well as financial value is coming to be recognised. There is a growing disinclination to regard mental disorder from its legal aspect. Although at present it is essential for the public and for the doctor that there should be legal safeguards in certain cases, the profession, and the public after them, are beginning to realise that the care of the mentally sick is a purely medical and highly technical matter. The change of opinion is reflected in the fact that in some cases 50 per cent., in others 80 per cent., of the inmates of these institutions are "voluntary boarders," free to leave at 24 hours' notice at any time. It may not be long before 100 per cent. becomes a common record and the certified case is regarded as a slur on the early measures taken. It is realised that mental disease, apart from a small proportion of toxic cases, is a thing of slow development, which leaves time for preventive measures. One superintendent puts biological stress at the head of his list of causation, and such stress is to be recognised and dealt with before the adaptatory functions of the individual have broken down. Another report points out that half of the annual admissions had shown symptoms for more than a year; had competent advice been sought earlier probably few of these would have required certification at all. It is the general practitioner alone who can recognise these early signs and warn the patient or his relatives of the need for care at a time when treatment would be accepted without resistance and breakdown might be averted. Public interest is awakening to the problem of the early mental case, and practitioners must give some thought to the matter if they are not to be found wanting.

AN AMERICAN SMALL-POX EPIDEMIC.

THE Detroit Department of Health has just issued an instructive report on last year's epidemic of small-pox. The rapid growth of this industrial city has attracted a large migratory population which no doubt accounts for the rather high incidence of small-pox in the last ten years. In 1918 there were 893 cases with 6 deaths, in 1920 4 deaths in 1125 cases, but in 1924 a more serious outbreak with 1610 cases and 163 deaths. The high fatality as shown by the following table was largely due to the appearance of hæmorrhagic small-pox.

Case Fatality-rates.

	Cases.	Deaths.	Rate per cent.
Hæmorrhagic ..	124	123	99
Confluent ..	219	9	4.1
Discrete ..	441	7	1.6

The names and addresses of contacts being taken usually about midnight, when everyone was at home, provided an exceptionally complete list of those known to have been exposed to contagion. The vaccination history was obtained and the quarantine enforced at the same time. Those exposed to risk could thus be divided into classes according to their vaccination status, and as the subsequent incidence of small-pox is known we have an admirable index of the efficiency of the vaccination shown in the following table:—

	Exposed to risk.	Number who developed small-pox.	Percentage incidence of small-pox.
Vaccinated within 5 years of exposure ..	928	0	0
Vaccinated more than 5 years previously ..	1296	27	2.1
Never successfully vaccinated ..	1350	180	13.3

One table in the report shows the result of exposure according to the type of case to which the contact was exposed and the time of vaccination within the incubation period. The numbers in these classes are small in any case, and as they are expressed merely as numbers and not as rates few conclusions can be drawn. It is worthy of note, however, that 38 persons who were successfully vaccinated within four to eight days from the time of exposure contracted the disease in one form or another. Clearly it is not safe to put off vaccination until one is known to have been in contact with a case. The conclusion which the Health Department of Detroit draws from this experience is that vaccination ought to be compulsory.

AN EAST COAST PORT.

THE annual report of Dr. B. C. Stevens to the Grimsby Port Sanitary Authority gives a good idea of the importance and variety of the medical service of a port. Although no scheduled cases of infectious disease were landed during the year 1924, 38 cases of other disease came under notice, amongst them 18 of influenza. Rats to the number of 1410 were killed in steamers, 1883 in trawlers, 5786 in warehouses and elsewhere about the port; 483 were killed in 12 ships fumigated with sulphur, averaging 41 in each, and 2795 in 91 ships by baits and traps, averaging 31 in each. Of the 9079 killed in ships and port, 543 individuals were black, 8536 brown. Most were killed in May, especially in the warehouses. No remarks are made by the port medical officer on venereal diseases as they affect shipping. Alien passengers, numbering 2219, entered at this port "invariably clean," as the medical officer remarks. Regular inspection of the water tanks of the port led to no complaints. Of 3166 foreign-going craft, 96 were reported to have sanitary defects, and of 238 coasters, 194; 34 sanitary defects were found during 103 inspections of canal boats. 3458 inspections were made of ships and fishing boats; the chief

occasion of complaint being dirt: 374 had dirty food lockers, 49 beds were filthy and destroyed (227 others, not so bad, were ordered to be cleaned), 144 ships had dirty fo'c's'les, 70 had dirty or choked w.c.'s, 33 had dirty galleys or cooking utensils, and 3 had dirty forepeaks, being the compartments just below the crew's sleeping-place, which, if dirty, are a nuisance to them. Also 10 ships were verminous. There were some structural defects: 95 decks leaking, 37 defective drinking-water tanks, 69 defects in lighting, defective stoves 30, defective ventilation 27. Fish arriving unfit for food is made into manure; 400 tons of fish were condemned in the year under review along with much other food. The disposal of refuse from fishing boats still causes offence to the town-dwellers, but the gradual rebuilding of the fish market gives tardy hope of betterment. The number and variety of subjects mentioned in this and other reports of the medical officers of port sanitary authorities show clearly how important are their duties. The sailors in the ships are advantaged in comfort and health by criticism of their surroundings if uncleanly or otherwise unhealthy; any defects which may be found are now more readily corrected than they were, and free treatment for venereal disease is available. The public, too, is advantaged by the destruction of unsound imported foodstuffs, while the constant war on rats is but an incident in the unceasing watch against the entry of epidemic or infectious disease from overseas.

ATMOSPHERIC POLLUTION.

THE tenth annual report¹ of the Advisory Committee on Atmospheric Pollution covers the period from April, 1923, to March, 1924, and is the largest and most interesting report yet issued. The report deals with various aspects of the central problem, and is divided into eight sections. In Section 1 are given the results of measurement of deposit from the air at different stations, classified according to the amount of deposit, the average monthly values being compared with the previous five years' average and a comparison of summer and winter deposits being made. Out of 28 stations the deposit of tar was lower than the five-year average in 21, higher in 3, and equal to it in 4. Tar is a good indicator of the amount of coal smoke. The insoluble sooty matter was below the average in 18 out of 29 stations, and above it in 11. Section 2 deals with suspended impurity. The results were obtained with the automatic filter, and curves are given for two new stations, Blackburn and Stoke-on-Trent. It is curious to observe the peculiarities of the curves compared, for example, with London, as shown in previous reports. Blackburn shows a double maximum on weekdays, the first about 9 A.M., the second about 11 A.M.; it is significant that the first maximum disappears on Sundays. Comparison between the automatic filter and jet-dust counter indicates a close agreement between these methods: about 10,000 particles per c.cm. correspond with about 0.8 mg. per cubic metre. In Section 3 is given a description of the remarkable darkness which overtook London on Jan. 23rd, 1924. The electric load diagrams reproduced give some idea of the cost to Londoners of a smoke effect of this description. Section 4 deals with the jet-dust counter devised by Dr. J. S. Owens, and a full account is given of the technique in using it. Illustrations show a similarity between mould cells obtained in dust records and cells from dead leaves, indicating a possible source of the cells found in the air. A new form of dust counter is described in Section 6. This is used for the examination of very coarse dust and operates by isolating a column of the air to be tested, allowing the dust to settle and examining the particles which fall upon a known area. Section 7 deals with the dust in the upper air, and sets out the results obtained by Dr. H. H. Kimball,

of the U.S. Weather Bureau. The average diameter of dust particles collected at an altitude of 10,000 feet is only a quarter of those in the surface air. In Section 8 an estimate is made of the effect of atmospheric pollution upon visibility. Tests made with a specially designed instrument show a range of transmission through 50 feet of air varying from 99.66 per cent. of the light when the number of suspended particles amounted to 210 per c.cm., to 22.7 per cent. when the number of suspended particles was about 80,000 per c.cm. The report appears at a time when public attention is at last concentrated upon the need for purifying the air, and should be a great incentive to measures directed against atmospheric pollution.

BRITISH practitioners can again enjoy unrestricted freedom of practice in Italy. The difficulties of the last 18 months have been adjusted, and the General Medical Council has now been officially informed that the Italian Embassy in London has communicated to all the consular offices under its orders the regulations concerning the admissions of British registered practitioners to the privilege of practising medicine in Italy and its dependencies. The new agreement, which reinstates the reciprocity of 1910, comes into force from the date of its signature (May 21st, 1925) without the need for further ratification or approval.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. W. Keir to be Surg. Capt.
W. G. F. Murray, J. G. Maguire, and S. Morrow to be Surg.-Lts.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg.-Lt. Comdr. D. D. F. Macintyre, T. B. Dixon, and L. S. Ashcroft to be Surg. Comdrs.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. C. G. Thomson retires on account of ill-health.
Capt. R. C. Aitchison retires, receiving a gratuity.
Capt. J. Stephenson, half-pay list, late R.A.M.C., retires on account of ill-health, and is granted the rank of Maj.

MILITIA.

Capt. F. L. Tulloch to be Maj.

TERRITORIAL ARMY.

Maj. C. S. Wink and Capt. W. D. Carruthers resign their comms. and retain their rank.
Capt. R. G. Addenbrooke (late Worcestershire Regt.) to be Lt. and relinquishes the rank of Capt.
Capt. G. M. Brown (late R.A.M.C.) to be Capt.
Capt. A. Angus (late Northumberland Fus.) to be Lt. and relinquishes the rank of Capt.
A. H. G. Down to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. A. L. Taylor, from Active List, to be Capt.

ROYAL AIR FORCE.

Air Commodore D. Munro to be Air Vice Marshal.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Col. C. F. Marr.

THE PAYING PATIENT.—On July 7th the Queen opened at the Hospital for Women in Soho-square a new ward containing 12 cubicles for patients who will pay from five to seven guineas a week, in addition to fees to physician or surgeon. The Royal Free Hospital will shortly set aside small wards and private rooms for paying patients.

INTERNATIONAL RED CROSS NURSING.—The Duchess of York last week opened the residence for international students which has been provided by the League of Red Cross Societies, at 15, Manchester-square, London, W. The house will provide a home for nurses from all parts of the world who come to take the League's courses, now in their fifth year, and those who have already obtained their certificates are teaching at home what they have learned in England. In addition to the English students the Duchess presented certificates to nurses from New Zealand, Holland, Greece, Norway, Czecho-Slovakia, Latvia, Belgium, Austria, Germany, Switzerland, and Siam.

¹ Meteorological Office, Air Ministry. M.O. 270. H.M. Stationery Office. 4s.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXX.

THE TREATMENT OF DISSEMINATED SCLEROSIS.

DISSEMINATED sclerosis is an infective disease of the central nervous system, which usually starts between the ages of 15 and 30. In its typical form the disease is characterised by relapses and remissions. This feature is of the utmost importance in diagnosis and can be explained by the invasion, from time to time, of an organism or its toxin into the brain and spinal cord producing an acute inflammatory lesion. This prevents the conduction of nervous impulses through the affected area. Depending on the situation of the "patch," various symptoms will be produced, such as paræsthesia in a hand, weakness of a leg, failure of vision, a "stroke," &c. After a short time the inflammatory process subsides, often without leaving any permanent damage behind it, and this clinically results in a remission. As the onslaughts on the nervous system become more frequent, or intense, irretrievable damage to important conducting pathways in the brain or spinal cord follows, and a permanent disability, such as a paraplegia, results.

The causative organism has not been definitely determined upon, but there is some evidence in favour of the view that the disease is due to a spirochæte, which, however, is not *Spirochaeta pallida*. Spirochætes occur in the mouth and intestines of a large number of healthy persons; they are frequently present in diseased tonsils; they exist in the middle ear in many cases of otitis media, and therefore, presumably, may be present in infections involving any of the sinuses which communicate with the nasal passages.

Clinical Forms.

It must be remembered that the classical picture of disseminated sclerosis, as described by Charcot, consisting of intention tremor, scanning speech, and nystagmus, is present, in its entirety, in only about 14 per cent. of cases. The most important part in the investigation of a possible case of disseminated sclerosis is a close inquiry into the previous health of the patient. In a person between the ages of 15 and 30 the occurrence from time to time of symptoms referable to the central nervous system, which appear suddenly and are often accompanied by slight pyrexia, sometimes earning the name of "influenza," and which clear up as a rule within a few days or weeks, should strongly suggest a diagnosis of disseminated sclerosis, provided the Wassermann reaction is negative. These symptoms, which may occur singly, are: temporary diplopia, temporary blindness, paræsthesiæ in one or more limbs, weakness or stiffness in an arm or leg, precipitancy of micturition or actual incontinence, and attacks of vertigo, often with headache.

Further, the rarer manifestations of this disease should not be overlooked. (a) Cerebral form, ushered in by a "stroke," usually without loss of consciousness (sometimes a fit, indistinguishable from epilepsy, may complicate the picture), and attended by a hemiplegia, which clears up quite rapidly. Further "strokes" may occur, affecting the limbs on the same or opposite side. In a person under the age of 40, in whom a hemiplegia occurs, if syphilis, cardiovascular disease, and a cerebral tumour can be excluded, disseminated sclerosis should always be thought of as a possible cause. (b) A retro-bulbar

neuritis, which is due to a patch somewhere in the optic nerve, producing varying degrees of temporary blindness, may be the first sign of the disease. A similar condition may result from an infection of the sphenoidal and posterior ethmoidal cells, and this must be excluded. (c) The spinal form of disseminated sclerosis, characterised by a paraplegia without nystagmus, intention tremor, speech defect, or affection of the arms. Such cases must be differentiated from spinal syphilis, spinal cord compression, and subacute combined degeneration of the cord.

On examining a suspected early case, attention should be paid to the presence or absence of the following signs: Nystagmus; pallor of the temporal half of one or both discs; weakness and ataxia of an upper or lower limb, often with some loss of postural sensibility; exaggeration of the deep reflexes on one side or in one limb; a unilateral Babinski, or even an indefinite plantar response; and diminution or absence of the abdominal reflexes, on one or both sides. If no definite physical signs can be elicited the case should not too rapidly be labelled hysterical, but the patient should be requested to report at once should any deviation from health be observed. It is only in this way that an early diagnosis can be made.

A case of disseminated sclerosis is always a long and protracted affair. The doctor should not be misled, as is often the patient, by the natural remissions of the disease, into believing that a particular form of treatment is proving curative. It is necessary to watch the patient closely, for, unfortunately, it may be assumed that a relapse will sooner or later ensue, and patiently to treat symptoms as they occur. Certain general measures can be laid down.

General Measures.

It is of importance to deal at the outset with all possible foci of sepsis. The mouth should be carefully overhauled, and all septic teeth or stumps removed, but this should not be done in an indiscriminate manner, as a relapse may follow, within a few hours, the too drastic clearance of septic stumps. The tonsils, if severely infected, should be removed. In cases which have shown blindness in the initial stages of the disease, an examination of the posterior ethmoidal and sphenoidal sinuses should be made to exclude infection. The optic nerve is separated from these sinuses only by a thin layer of bone, and therefore an infection may readily pass to the optic nerve, as occurs in cases of optic neuritis associated with suppuration in these sinuses. Any middle-ear infection should be dealt with. The general health should be carefully looked after and over-fatigue avoided. Alcohol and tobacco should be indulged in but sparingly. Special attention should be paid to constipation, which often becomes aggravated prior to a relapse.

During a relapse the patient should be confined to bed at least for a week, but preferably longer, and the diet should be light.

Medicinal Treatment.

Arsenic is the drug that has been used for many years past in the treatment of this disease. It can be administered orally in the form of liquor arsenicalis, commencing with 2 minims thrice daily, gradually increasing the dose so that at the end of three weeks the patient is taking 20-30 minims during the day. At the end of four to five weeks the treatment should be stopped, when mercury and iodides may be substituted. Further courses of arsenic should be given with monthly intervals for several years. Incontinence of urine can be helped by the administration of tincture of belladonna. Painful flexor spasms, which may be troublesome in the later stages of the disease, can be alleviated by the use of hot baths or radiant heat and by a single dose of sodium bromide, gr. 15-20, at night.

Special Forms of Treatment.

In practice such treatment, founded on the assumption that a spirochæte is the causal organism in disseminated sclerosis, is sometimes beneficial, and in a few cases seems to arrest the progress of the disease; but as this form of treatment has been under trial for a comparatively short time, it is too early to judge of its permanent effects. Such treatment is only of use in the early stages of the disease before extensive and irreparable destruction of nervous tissue has taken place. A course of six to eight injections of N.A.B. at weekly intervals may be given, the maximum dose not exceeding 0.6 g. Concurrently mercury should be administered either orally (1 drachm of the liq. hydr. perchlor. thrice daily), by inunction (1 drachm daily), or intramuscularly. Potassium iodide, commencing with gr. 15 and increasing to gr. 30, thrice daily, should also be administered. At the end of the course of N.A.B. the mercury and iodide should be stopped for two or three weeks, and during this time an iron mixture may be substituted. The mercury and iodide should then be resumed, and at the end of a further three or four weeks a further course of N.A.B. should be given. Further courses of treatment should follow with suitable intervals.

Various preparations of organic bismuth compounds have been recently investigated in France in the treatment of syphilis and have been found to possess spirillicidal properties only slightly inferior to those of arsenic. These preparations¹ are given intramuscularly into the buttock. In the treatment of disseminated sclerosis they may be used alternately with N.A.B., or may replace this drug should the individual prove hypersensitive to arsenic. A course consists of 10-12 injections, one or two injections being given each week.

Typhoid Vaccine Treatment.—This non-specific form of treatment, probably allied to protein shock, seems to have a favourable effect in some cases in bringing about a remission. A course of about ten intravenous injections of typhoid vaccine are given at an interval of two days. The first dose is 25 millions, and with each subsequent injection the dose is increased, an effort being made to bring about a moderate rise of temperature after each injection. N.A.B. in small doses may be given concurrently at weekly intervals.

Treatment in the Advanced Stages.—In an advanced case with severe paraplegia any treatment can only be palliative, and the special forms of treatment outlined above are, as a rule, contra-indicated. Arsenic should, however, be given by the mouth.

It is not uncommon to find a hysterical element grafted on to the organic paraplegia. This, if recognised, may be removed by means of persuasion, so enabling the patient to use the limbs more than seemed previously possible. The patient should be encouraged to use the affected limbs, and unless in the final stages every effort should be made to prevent him becoming bed-ridden. Massage is of considerable importance, but even more so are a series of active and passive movements. Electrical treatment is rarely called for and may be injurious. Spasticity may be lessened by passive movements and the application of hot baths or radiant heat. Frequently there is a tendency for contractures to develop in the tendo Achillis; a light aluminium shoe should be worn at night in order to prevent this deformity. Re-educative exercises will lessen incoördination and ataxia. A walking chair may be used in order to give the patient confidence.

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¹ Quinby, bismuthyl, and biquinyl are prepared in France; luatol, bismostab, and bismuth metal in England.

*Special Articles.*SOME GENERAL REFLECTIONS ON
PUBLIC HEALTH ADMINISTRATION.

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I.

DISTRIBUTION OF LEGAL RESPONSIBILITY
BETWEEN CENTRAL AND LOCAL
AUTHORITIES.

THE extension of civilisation in all communities and the increasing complexity in the relations between adjacent communities has rendered necessary in every country a review of the conditions of local government. The functions of community government are always found to be divisible into:—

- (a) Those matters which affect only individual communities;
- (b) those matters which affect several immediately adjacent communities;
- (c) those matters which affect in common all communities belonging to one nation.

Of these, (a) and (c) are naturally fairly well defined, while (b) is liable to variations arising from topographical, social, or other conditions.

A brief review of the historical evolution will assist to a comprehension of the basic factors which have produced the present status.

England.

England is the original home of the people of each of the countries discussed, and from England each of these communities derived their traditional conceptions of community government. In the historic evolution of the English constitution, after the country had come definitely under one government, this government consisted of a centralised autocracy, which has become modified by increasing stages, until now each local authority has been granted, by concessions from the central authority, a considerable amount of local self-government. There still, however, persists an indication of the centralisation of power in the obligation (often nominal only) resting upon the local authority to secure the approval of the central authority to many executive acts. At first the subdivision of authority between the central government and the local authority was sufficient for all health purposes, and it remains sufficient still in the case of towns and cities which have a population and a revenue sufficient to maintain an adequate health organisation on modern lines. In the country districts, however, with scattered populations and small revenues, but with most of the public health difficulties in miniature, the maintenance of an adequate health organisation is forming a real administrative problem. Moreover, the increasing inter-relationships between contiguous local authorities have introduced problems beyond the solution of any individual local authority. Consequently, the county administration, embracing often many local authorities, is becoming invested with public health functions to an increasing degree. Not only is this so, but the health authorities are now considering the advisability of grouping together small local rural authorities into health districts within counties.

Virginia.

Virginia was colonised by persons holding tenure by royal favour and persons largely respectful of the established constitutional forms of government. Necessities, however, of the early development of Virginia forced upon the colonists in the different districts of the colony a larger measure of self-government than was customary at the time in England, and in the development of Virginia local self-government has progressed vigorously until the present

condition is that the degree of authority possessed by the local authority is greater than that possessed by the central authority. Consequently, in the large towns the health organisations are as vigorous as, and possibly more vigorous than, the central authority—the State Health Department—but on the other hand the rural districts are very backward and the central authority is now concerning itself with the development of the backward rural communities.

Massachusetts.

Massachusetts was founded by the Puritans in a state of fierce revolt against constituted authority, and in the form of government which they adopted for themselves the central authority of any kind was deliberately omitted, a highly individualised form of government being adopted. The same general basis of government exists to-day. Each local community has practically absolute powers of self-government—the central government (the State legislature) being granted further powers only as these are found to be essential to the common good. In health administration it is found that each community is practically a law unto itself, the central authority—the State Department of Health—being largely without power of supervision or direction, and being given power to deal only with functions of government which concern the State as a whole or a number of local authorities in common. It is, however, fully recognised that the modern conditions of social organisation render necessary the endowment of the State authority with greater constitutional powers than it now possesses, and the State Health Department is becoming invested with greater powers, without, however, as yet any recognition of controlling authority over the actions of local authorities. This gradual surrender of power to the central authority—the State Government—can be traced in the form of the existing Massachusetts health laws. The powers and duties of the State Department of Health are specified thus:—

"The Department shall take cognisance of the interests of life and health among the citizens of the Commonwealth, make sanitary investigations and inquiries relative to the causes of disease, the sources of mortality, and the effects of localities, employments, conditions, and circumstances on the public health. It shall have oversight of inland waters, sources of water-supply, and vaccine institutions. It shall annually examine all main outlets of sewers and drainage of towns of the Commonwealth, and the effect of sewage disposal."

In contrast to this nebulous and indefinite statement of the status of the State Department, the powers of the local authority are thus concisely and comprehensively stated:—

"Boards of health may make reasonable regulations which shall be published once in a newspaper published in the town. All regulations made hereunder which provide a penalty for violation thereof shall before taking effect be approved by the Attorney-General."

It may be noted that the approval is not to be given by the State Department of Health, but by the Attorney-General.

Notwithstanding this general position which apparently largely secures the independence of the local authority, it has been found necessary from time to time to recognise the domination of the State. This is indicated in two stages by the following related sections of the Health Act:—

"If small-pox or any other contagious or infectious disease . . . exists in any place within the Commonwealth the department shall make an investigation thereof, and shall consult thereon with the local authorities. It shall have coördinate powers as a board of health, in every town, with the board of health thereof."

"Towns may establish and maintain dental, medical, and health clinics, and in connexion therewith may conduct campaigns of general education relative to matters of public health."

"Every city and every town having a population of ten thousand or more shall establish and maintain within its limits a dispensary for the discovery, treatment, and supervision of persons afflicted with tuberculosis. Such dispensaries shall be subject to the regulations of the boards of health of the towns and shall be inspected by and be satisfactory to the department."

The complexities of administration thus produced have been one factor in the creation of the intermediate unit, and the law now reads:—

"The Commissioner shall divide the State into not more than eight health districts."

Each such district has a district health officer who shall act as the representative of the Commissioner with all the powers possessed by the department itself.

It is apparent that Massachusetts from the most extreme form of local self-government has progressed to the creation of district groups for common needs and of State authority for general needs and for unity of authority. The special mention of supervision of water-supply and sewerage may be here indicated as noteworthy.

North Carolina.

In the State of North Carolina, similar in its history to Virginia, the legal public health code gives evidence of the retention of a constitutional form of centralised government, acting at first against a strong tendency to localisation but subsequently going rather to the other extreme and exhibiting an activity on the part of the central authority in matters of detail which are rightly the concern of the local authority. The powers of the central authority—the State Board of Health—are expressed only a little less vaguely than are those of the State Department of Health in Massachusetts, thus:—

"The Board of Health shall take cognisance of the health interests of the people of the State, shall make sanitary investigations and inquiries, shall investigate the causes of diseases dangerous to the public health, the sources of mortality, the effect of location, employments, and conditions upon the public health . . . In times of epidemics, the State Board of Health shall have sanitary jurisdiction in all cities and towns not having regularly organised boards of health and are empowered to make all such regulations as they deem necessary to protect the public health, and to enforce them by suitable penalties."

The powers of the local authority, on the other hand, are briefly but decisively and comprehensively expressed:—

"The County Board of Health shall have the immediate care and responsibility of the health interests of their county. They shall make such rules and regulations as in their judgment may be necessary to protect and advance the public health."

Notwithstanding this central impotence and local autonomy in the basic legislation, it has been found necessary, as in Massachusetts, to give the central authority paramount jurisdiction in all matters relating to sewerage and water-supply, although the abatement of nuisances remains a function of the local authority. There is, however, seen in the North Carolina code a very curious anomaly—the central authority is entrusted with the supervision of all privies:—

"The State Board of Health, through its officers and inspectors, shall exercise such supervision over the sanitary construction and maintenance of privies as may be necessary to enforce the provisions of this article . . . the owner of each privy shall pay to the officer or inspector of the State Board of Health . . . a license fee of forty cents."

The State of North Carolina provides an example of a statutory code in which the predominant power rests with the local authority and also of an administrative organisation in which it has been realised within recent years that the local authorities were not using these powers. In consequence, abrupt transfer of routine detail to the central authority has occurred, supervision of matters of "State-wide" importance, such as water-supply and sewage, has been placed in the hands of the central authority, and an enlightened State administration is now actively concerned in stimulating the local authority by various ingenious devices to a better realisation and a more efficient discharge of its responsibilities.

New York.

The State of New York, cosmopolitan in its history and cosmogenic in its development, provides an example of legal and administrative indefiniteness

which conforms to no general rule. The powers of the central authority—the State Public Health Council—are specified as follows:—

“The Public Health Council shall have power to establish sanitary regulations called the Sanitary Code. The Sanitary Code may deal with any matters affecting the security of life or health or the preservation and improvement of public health in the State of New York. The provisions of the Sanitary Code shall have the force and effect of law. No provision of the Sanitary Code shall relate to the City of New York, and every provision of the Sanitary Code shall apply to and be effective in all portions of the State except the City of New York.

“The provisions of the Sanitary Code shall, in the territory prescribed therefor by the Public Health Council, supersede all local ordinances heretofore or hereafter enacted inconsistent therewith.

“Each city, town, or village may enact sanitary regulations not inconsistent with the Sanitary Code established by the Public Health Council.

“Under the public health law, all local health officers have the power, and it is their duty, to carry into effect the provisions of the public health law and the Sanitary Code.

“The State Commissioner of Health, under the same law, has the power, and it is his duty to exercise general supervision over the work of all local health authorities, except in the City of New York, and to see that the provisions of the public health law and the Sanitary Code are enforced.”

The status of the local authority as defined in the Sanitary Code is this:—

“The term ‘board of health’ or ‘local board of health’ means the local board, department, or Commissioner of Health, or other body or official of a municipality having the usual powers and duties of the board of health of a municipality.”

New York State is a striking instance of a State in which the central authority has paramount powers of wide scope. It is very interesting to find that a great deal of public health advancement is being achieved by this State Council without much resort to legal authority, but almost entirely by example, education, and exhortation.

New South Wales.

New South Wales, founded on a basis of necessary military autocracy in which the good of the community was paramount and the welfare of the individual of little account, has gradually throughout the century and a half of its existence evolved a form of government in which the centralisation of authority still persists to a high degree with a slow release of power into the hands of the local authorities. In the existing form of health administration there is still a greater degree of centralisation than exists in the other Australian States. The following paragraph, from the Health Act, 1915, breathes the old spirit of autocracy which is now rapidly disappearing all over the British Empire:—

“The Board (i.e., the State Central Health Authority) may require the council of a municipality or shire or its officers to do any specified acts in relation to any of the matters mentioned in Part I. of the schedule which might lawfully be done by such council or officers in virtue of any power (except the power to make ordinances or by-laws) conferred or of any duty imposed by any statute, regulations, ordinances, or by-laws, and may in such requirement specify the time within which and the manner in which such acts shall be done.

“If such Council or officers fail to carry out any such requirement as aforesaid, the board may do or cause to be done the said acts, and for that purpose shall have the powers of such council or officers; and thereupon the board may demand the payment to it by the council of any expenses incurred by the board in doing the said acts or causing them to be done. Any regulations, ordinances, or by-laws which relate to any of the matters mentioned in Part I. of the schedule shall, before being made, be submitted to the board. Such regulations, ordinances, or by-laws shall not be made unless the board gives its approval of such of the provisions thereof as relate to the matters aforesaid.”

The “matters mentioned in Part I. of the schedule” are:—

“Keeping premises free from offensive or unwholesome matter and the suppression of nuisances arising therefrom. Regulating the storage, sale, conveyance, disposal, and delivery of meat, fish, oysters, and crustacea. Regulating cattle intended for slaughter and regulating abattoirs

and slaughter-houses. Sewerage and drainage. The removal of nightsoil, filth, refuse, and garbage, and the destruction of garbage. The construction and situation of privies, the regulation of the degree of closet accommodation. Public urinals, closets, and lavatories. The sanitary requirements of public baths, dressing sheds, and dressing rooms. The regulation and control of common lodging-houses and seamen's boarding-houses. The establishment, control, maintenance, and regulation of infants' milk depôts. The regulation of the interment of the dead.

The central health authority, however, is not so entirely independent as the above quotation might suggest. In the Public Health Act of 1902 there occurs this paragraph:—

“The Board may at any time make a report to the Secretary for Public Works whenever, in its opinion, any danger to public health, or to the health of any persons, could be removed or diminished by the exercise by any water-supply and sewerage board of their powers under any Act . . . and the Secretary for Public Works shall thereupon proceed as he may think fit.”

Victoria.

Victoria, dominated in its earliest years by the influence of New South Wales, has undergone development in a different direction. At an early stage in its career certain local communities revolted against the arbitrary exercise of central authority, and there has consequently developed in Victoria a form of government in which the local authorities exercise in practice a considerable degree of self-government. It will be of interest to quote certain sections of the Health Act of the State of Victoria. The specifications of the powers of the central authority—(i.e., the Commission of Public Health) are as follow:—

“In addition to any other powers and duties of the Commission, the Commissioner may exercise all or any of the following duties: (a) To promote the prevention, limitation, and suppression of infectious and preventable diseases. (b) To report to the Minister upon matters affecting the public health and upon any amendments which it thinks advisable in the law relating thereto and upon matters referred to it by the Minister. (c) To promote or carry out researches and investigations and to make inquiries in relation to matters concerning the public health and the prevention of treatment of disease. (d) To publish reports, information, and advice concerning the public health, and in particular concerning the prevention and control of disease and the education of the public in the preservation of health. (e) To advise and assist councils in regard to matters affecting the public health. (f) To prepare regulations under this Act for submission to the Governor-in-Council. (g) To prepare model by-laws for adoption by councils pursuant to this Act.”

In order to meet any urgent contingency the Commission is invested with special powers:—

“In any emergency or sudden necessity (of the existence of which emergency or necessity the Commission shall be sole and final judge) the Commission may for the purposes of this Act exercise and perform in any part of Victoria all or any of the powers and duties of a council.”

To provide for decentralisation of the administrative functions of the Commission provision is made for the appointment of district health officers whose function are defined as follow:—

“Every district health officer shall: (a) Be subject to the directions of the chief health officer; (b) report quarterly and also annually to the chief health officer on the public health and sanitary circumstances of the health area; (c) make to the chief health officer as occasion requires such suggestions as the district health officer thinks desirable for more effectually promoting the objects of this Act; (d) advise and assist as he deems fit medical officers of health and inspectors of councils having jurisdiction in the health area and any part thereof; (e) exercise such powers and duties to the chief health officer as are assigned to him under this Act by the chief health officer and perform such duties as are required by the Commission or as are prescribed; (f) perform such duties in connexion with the medical inspection of and the promotion of the health of school-children as are prescribed.”

Notwithstanding that the duties as here prescribed consist largely of supervision of a paternal nature there are definite powers of compulsory direction. For example, the Commissioner may enforce the appointment of a medical officer of health by any council; the Commission may make regulations “generally,

carrying into effect the purposes of the Act"; and it has reserve powers of compulsion over any council which fails to discharge any of the duties statutorily prescribed.

While there is in Victoria very extensive local autonomy, there is also comprehensive central direction. This relationship is well-illustrated in the following clause:—

"Every council (a) may, and when required by the Commission shall make or adopt by-laws for all or any of the purposes for or with respect to which such council is authorised or required to make by-laws under the Act; and (b) shall when so required by the Commission revoke, rescind, amend, or vary or suspend the operation of any by-law.

"All by-laws made or adopted by a council under this Act: (a) shall be submitted to the Commission; (b) shall be subject to the approval of the Governor-in-Council; (c) may be revoked by order of the Governor-in-Council.

New Zealand.

New Zealand was at first colonised at separate points by communities with little in common, each having a practically independent form of government. Effective central government has only gradually evolved. In 1900 was passed the Health Act, which to a very large degree centralised authority and rendered all health administration practically independent of local authorities; but this was found to be unsatisfactory, and in 1920 the legal health code was revised. Now responsibility in most matters of health administration is placed directly upon local authorities. This basis of local independence, which is at the root of the New Zealand system of government, has led each of the local communities to acknowledge its responsibilities to an extent unfamiliar in Australia, and is the largest factor in producing the advanced state of progress in public health in New Zealand due to this local independence of spirit. It is probably accurate to say that every town of more than 1000 population has a modern water-supply and a modern water-carried system of sewerage. This spirit of local self-reliance has also been an important element in the success of the Plunkett Society in New Zealand.

The Need for Modification of Existing Arrangements.

It is clear that all of these English-speaking countries, with English tradition as a foundation, have evolved towards an increasing local self-government; but the distribution of authority between the central authority and the local authority has taken different forms in different countries. In England there is the nearest approach to administrative regularity with wide powers of local autonomy and general powers of control and supervision by the central authority. But even in England the evolution of the public health system has produced anomalies—the distribution of health functions between the local authority and the county not being such as to satisfy many whose opinion is valuable. Moreover, the equipment and organisation of efficient public health administration to-day are beyond the resources of many of the 649 rural district councils, and the necessity for finding some more satisfactory system of organisation and for expressing such in the legal code is becoming increasingly apparent.

From these examples it is clear that whether health administration started from a centralised autocracy or from localised autonomy, all governmental systems are reaching, by different paths, a type of health administration more or less uniform. The routine local functions, principally control of the environment, are the concern of the local authority, however large or small. The general direction of health policy, a paternal supervision, and the control of matters of common application are the duty of the central authority. It is in relation to the intermediate unit that confusion exists, and an analytical contemplation of the whole field impresses one with the conviction that difficulty mainly arises from the increasing range of matters of individual hygiene constantly being brought within the scope of official public health administration.

A recent survey of many practical attempts to codify this whole problem in legal expression as well

as in administrative experiment has confirmed my opinion that a general review of the administrative public health system, at least in English-speaking countries, is overdue. The excessive attention recently paid to matters of individual hygiene, to "campaigns," "demonstrations," and the like, has obscured the necessity for progressive order and good government marching in step with other progress—and legal and administrative confusion is imminent where it has not already occurred. A definition of functions, possibly a modification of both the legal code and the administrative systems, is required, and particularly it is necessary that the diffusion of functions among many authorities shall cease and a logical system of graded responsibility be introduced.

The State of Ohio, U.S.A., claims to have made a practical step towards the reduction of the confusion. Under the old system there were 1300 townships and 700 towns and cities (with a population of 5000 or over) with some sort of county organisation, but this county organisation did not have any health administrative functions. Under the present system there are 86 counties with good health organisation. All of these are doing what the law says they shall do, and many of these are doing in addition what the law says they may do.

The Commonwealth Government in Australia has just appointed a Royal Commission to suggest an organised scheme of rational progress with defined responsibility distributed amongst the different grades of governmental units, and it is expected that great advances will result from the work of this Commission.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 37.)

FRIENDLY SOCIETIES' MEDICAL ALLIANCE.

(App. LIII. and Q. 16346-16513.) The Friendly Societies' Medical Alliance represents the majority of the medical institutions approved under the Insurance Act for giving treatment to insured persons as an alternative to the panel system. The Ministry of Health have always held that they had no power to approve any institution not existing at the date of the passing of the National Insurance Act, 1911.

The principal contention of the Alliance in the evidence given by Mr. S. A. Syddall and Mr. Samuel Pride was that facilities should be provided for the recognition of newly-formed institutions and the extension of the radius of existing institutions throughout industrial districts by the opening of branch

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247-8); The Provision of Medical Benefit (Feb. 7th, pp. 301-3; Feb. 14th, pp. 355-6; Feb. 21st, pp. 403-5); Financial Provisions of the Act (Feb. 28th, pp. 454-7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508-9); The Approved Societies and the Money Benefits (March 14th, pp. 564-5; March 21st, pp. 623-4); Evidence of the Hearts of Oak Society (March 28th, pp. 677-9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731-3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784-6; April 18th, p. 839); Evidence of Mr. Alban Gordon (April 18th, pp. 839-40); Evidence of Joint Committee of Approved Societies, of Stock Exchange and Lloyds' Health Insurance Societies, and of Group of Catholic Approved Societies (April 25th, pp. 889-91); Evidence of the National Insurance Beneficent Society (May 2nd, pp. 943-4); Evidence of the British Medical Association (May 9th, pp. 993-5); Evidence of the British Dental Association and other Dental Organisations (May 16th, pp. 1044-6); Evidence of the Insurance Committees (May 23rd, pp. 1097-8); Evidence of Various Approved Societies (May 30th, pp. 1135-6); Evidence of the British Medical Association (June 6th, pp. 1184-6; June 13th, pp. 1248-50; June 20th, pp. 1315-6); Evidence of other Medical Bodies (June 20th, p. 1316; June 27th, p. 1348); Individual Evidence (June 27th, p. 1348); Medical Services in the Factory, Ministry of Health Inquiry Room, Evidence of National Sailors' and Firemen's Union and of Loyal Order of Ancient Shepherds (July 4th, p. 36).

surgeries. It was also claimed that as an insured person may change at any time from one doctor's list to another, a similar right of change between an approved institution and an insurance practitioner ought to exist instead of the present arrangement under which an insured person can only change over at half-yearly intervals.

The total adult membership of these institutions, including insured and uninsured, has declined from 238,000 in 1911 to 160,000 in 1924, and it was pointed out to the witnesses that this hardly appeared to suggest that the institution system was so popular or advantageous to the insured as to justify the case for their extension. The general burden of the evidence so far as this point is concerned seems to be that the institutions had not received fair treatment, and that as they were pioneers in putting something better in the place of the old discredited system of club doctoring and in providing efficient surgery and waiting-room accommodation, they were justified on merits in being more freely established for the treatment of the insured.

In reply to a question as to what an insured person would lose if a partnership or team of doctors were available for him as compared with an institution where three or four doctors were employed, Mr. Pride said that the insured person would lose control.

(Q. 16463.) We think we have a capital arrangement in our institutions. They are controlled by what are called lay committees, but they are composed practically, to the extent of 80 or 90 per cent., of insured persons, and they have a voice immediately in the direction and policy of the institution. They certainly do not with regard to the panel doctor, and you do not find a great many insured persons on insurance committees.

In regard to the investigation of complaints, the witnesses said that the rules of institutions provided the necessary machinery, but that they were quite prepared to accept the same machinery as that applied to panel doctors.

SOUTH WALES AND MONMOUTHSHIRE ALLIANCE OF MEDICAL AID SOCIETIES.

(App. LV. and Q. 16707-926.) The general purport of this evidence, given by Mr. Walter Conway and Mr. Evan Pugh, was the same as that of the Friendly Societies' Medical Alliance—i.e., that the embargo on the approval of new medical institutions should be removed, and that the administrative and financial conditions under which they work should be revised in their favour. It was also asserted by these witnesses that the insurance committees by their requirements interfered with and hampered the institutions on their voluntary side.

The members of the South Wales institutions are, to a large extent, miners, and under a system of payment of a poundage rate on their wages they secure treatment for their families and put up sufficient funds to cover such things as operations, dentistry, and ophthalmic treatment. The witnesses contended that for systems under which such a comprehensive organised effort was possible there should be every encouragement rather than the hampering conditions which at present obtained. They denied that there was any canvassing for members, and as regards any complaints against a doctor, they said that—

(Q. 16782.) Instead of the committee taking it up and dealing with it from what may be called the layman's point of view, we always approach the chief medical officer and let him deal with the matter and discuss it from the medical point of view. If there is anything to be said or done we leave it to him to do it.

With regard to the salaries paid, they said that they were willing to compare the amounts paid by the institutions to their doctors with the amounts paid by the doctors themselves to their assistants, and to stand or fall by the comparison.

FRIENDLY SOCIETIES' MEDICAL OFFICERS' UNION.

(App. LIV.; Q. 16514-16706.) This Union was formed to protect the interests of the medical officers of institutions who felt that they were unfairly treated by the Friendly Societies' Medical Alliance. Dr. D. Holmes, Dr. John Roberts, and Dr. A. Hamilton

gave evidence. Amongst other recommendations, they asked that medical officers of institutions should be liable to answer personally in any case of complaint to the duly constituted tribunals for panel practitioners, and that the amount of remuneration paid to medical officers for the panel work should be subject to approval by the Ministry of Health.

Their severe criticism of the way in which these institutions were controlled, with two or three exceptions, led a member of the Commission to ask whether it was really consistent on their part to urge the continuance of this system. The reply was that the system needed reforming and that what they wanted especially to get rid of was the lay control. One of the institutions excepted from their strictures was the Coventry Provident Institution, where the doctors have always had a voice in the management.

ASSOCIATION OF APPROVED SOCIETIES.

(App. XLV. and Q. 14251-14500.) This Association represents 150 societies of various types, with a total membership of 1,500,000. Mr. J. E. Hilton, Mr. Robert Smith, and Mr. F. A. Goodwin gave evidence.

Their recommendations in regard to medical benefit included a suggestion that the capitation fee of insured persons who had not selected a doctor should be applied to the provision of specialist and consultant facilities; another proposal was that members incapable of work should be requested to attend morning surgeries and so relieve the evening congestion.

A good deal of the oral evidence was devoted to the suggested merits of the system of payment by attendance over the ordinary capitation system, and of the merits of the Spahlinger treatment for tuberculosis, which the witnesses appeared to consider that the Ministry of Health and the General Medical Council were cold shouldering. Sir Humphry Rolleston said that he was inclined to expostulate against the suggestion that a doctor would not use a remedy to save the life of a patient unless it was guaranteed or authorised by the General Medical Council.

With regard to maternity benefit, it was said that nearly the whole of the cost of maternity benefit has now to be paid to the doctors, leaving the mother with little or nothing to meet other necessary expenses. They therefore advocated that fees payable for attendance by doctor or midwife should be a statutory charge on the general medical fund, and that a fee of £1 1s. be paid, the member being entitled to choose service of midwife or doctor.

STANDING COMMITTEE OF SCOTTISH INSURED WOMEN.

(App. XLVI.; Q. 14501-14592.) The evidence given on behalf of this Committee by Miss Amy Cameron and Miss Margaret Hamilton included the following suggestions:—

1. That definite provision should be made for the payment of sickness benefit to insured women during the four weeks immediately prior to confinement on the production of a medical certificate.

2. That when an insured woman marries, the fact of her marriage should make no difference to her position in insurance, and that she should be entitled to a free year's insurance as in the case of the insured in general.

3. That attendance at a confinement should not be included in medical benefit. It was, in fact, a matter for consideration whether the whole question of provision for maternity should not be dealt with quite apart from the National Health Insurance Act.

The Committee is not in favour of extending medical benefit to the dependants of insured persons on account of the difficulty of proving dependency, and also on the ground that the necessary increase of contributions would be an unfair tax on a very large number of insured women who would never benefit by the extension.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

(App. LVI. and Q. 16927-17126.) Dr. R. A. Lyster, President of the Society, and Dr. J. J. Buchan, of Bradford, said that while the Society fully recognised that much of the improvement in the social and economic and health conditions of the people

is the outcome, more or less indirect, of the National Health Insurance scheme, no real attempt has been made so far to attain many of the most important objects of the original scheme. It has become evident that the present system of National Health Insurance suffers great limitations in its possibility for promoting health, and that profound changes are required if the improvement in the health of the people is to continue to be aided and not impeded by it.

The relationship of the work under the National Health Insurance scheme to that done by local authorities should be of a most intimate nature, because (a) the work of local authorities in preventing sickness and physical incapacity and ameliorating disease reduces the demands on National Health Insurance; and (b) the material assistance and medical treatment provided promotes the general health of the community.

The witnesses suggested that the voluntary groupings of insured persons in approved societies for the purpose of controlling the funds at present available for health insurance is defective and requires regulation and amendment. In regard to insurance committees, the evidence recites:—

(App. LVI., para 7.) That these committees have certain general public duties, but they have failed to be efficient instruments in the promotion of better health conditions on account of (a) the very indefinite character of their duties; (b) their very peculiar constitution which results in their being composed, to a considerable extent, of men and women without a sense of responsibility to the public at large; and (c) the disregard of a public for a body which has never been representative of them. Insurance committees are, as separate bodies corporate, no longer required. Their duties would be more efficiently carried out by the local health authority.

The present duties of insurance committees in relation to propaganda and education in matters affecting health have been very fitfully carried out, and these duties could with advantage be placed on local authorities. As to maternity benefit, the witnesses thought that the only practical method by which this can be administered in the interests of the mother and child is by requiring local authorities to administer it through their statutory maternity and child welfare committees.

It is the view of the Society that the scope of medical benefit should be greatly extended and its administration transferred to the local authorities; that the advantages of medical benefit as extended should, as far as possible, be made available to the dependants of insured persons, and should also be made available to the poor, the Poor-law medical system being abolished.

For the financing of such an extensive scheme they contemplate that the present Exchequer grant for all services under the Insurance Act should be made available as a nucleus for the enlarged medical service locally administered. The Society believe that medical practitioners should in the future have a direct interest in maintaining the patients' health. Varying payments should, therefore, be made to medical practitioners for work in this direction, the funds for such payments being drawn from any saving resulting from decreased sickness or disablement payments. Up to the present there has been no special inducement for preventive work.

ROYAL MEDICAL BENEVOLENT FUND OF IRELAND.

At the recent annual meeting of the Fund, held at the Royal College of Physicians of Ireland, Sir William J. Thompson presided. The annual report showed that the amount disbursed in grants, of which there were 86 in the year, was £1755, as compared with £1540 in 1923-24. The increase of the general fund from all sources amounted to £2109 odd, including £442 15s. 10d. income-tax refunded for two years. Dividends and interest yielded an increased income of £48 19s. 2d. Subscriptions paid through branches, including those of the Dublin area, showed an increase of £21 9s. 6d., while those paid through the central treasurer had increased by £20 5s. No legacies were received during the year, and no addition was made to the invested capital of the Fund.

SUMMER SCHOOL OF MATERNITY AND CHILD WELFARE.

THE National Baby Week Council is to be congratulated on the success of its summer school. The proceedings were opened on July 1st by Lord Astor, Chairman of the Council, who read a message from the Queen expressing her warm interest in the movement, and wishing success to the present effort. About 200 delegates from statutory bodies and voluntary societies were present. The method adopted was to have the subject expounded in the first place by various experts and to follow this by a discussion as to how far the views expressed could be utilised for the benefit of the mothers and babies of the country.

The Psychology of Mothers and Children.

Prof. William Brown, Wilde Reader in Mental Philosophy, Oxford, dealt with the foundations of character. He deprecated the tendency, in the present state of our knowledge, to attach exaggerated importance to the action and interaction of the endocrine glands, and explained the principles of psycho-analysis. He pleaded that truth, beauty, and goodness should be rendered attractive to children, that fear and jealousy should be kept out of their education, and that an effort should be made to promote union with the spirit of the universe from the cradle to the grave.

The psychology of the expectant mother was dealt with by Dr. M. D. Eder, of the infant by Dr. Eric Pritchard, of the toddler by Dr. J. A. Hadfield, and of the abnormal child by Dr. A. F. Tredgold. Some of the points made by the various lecturers were: The expectant mother is best helped by allowing her ample leisure for her occupations and work, but when she is in psychological distress an endeavour should be made to arrive at the source of the trouble, or in other words, to make the unconscious motives conscious. The baby has a soul and a personality as soon as it is born, and its mental state should be studied by its reaction to stimuli. For example, intractable crying should be dealt with by investigating the cause of the crying. At the age of 2 a child is full of impulses, for all of which a form of expression must be found; they should never be repressed. Rightly treated the self-willed child becomes the strong-willed man or woman. From 3 to 4 years of age the child begins to learn self-mastery and self-discipline from within by the desire for achievement and the possession of ideals. At first the ideals are acquired from the parents, later they become the child's own. Hence the importance of the behaviour of the parents in order to prevent the acquisition of wrong ideals. The child of weak impulses may be too amenable; the self-willed child who has been crushed may develop into one with a morbid desire to hurt or with a want of self-confidence. The criminal child is one which has acquired, not inherited, wrong ideals. It is better to train a child by giving it a choice than by giving it orders. Children show persistency at a very early age if given liberty and allowed to find something which interests them. A child's achievements should not be praised overmuch. Abnormality in children may be divided into four classes—viz., abnormality in instincts, feelings, intellect, and intelligence. Defects in instinct may interfere with sucking or self-preservation. Combative, acquisitive, and sexual instincts may be exaggerated and another outlet must be found for them; hence the need for more playing grounds. Feelings and the capacity for emotion may be so exaggerated as to swamp the judgment and the control of the consciousness. We have tests for moral perception but not for moral sense. Some people only have a verbal morality and never develop a moral sense. Dull and backward children are a distinct class. The dull, the feeble-minded, the imbeciles, and the idiots are grades of the abnormal. Some children develop

functions early (precocious), others late (backward). Some children are backward as a result of illness. Intellect is to be distinguished from intelligence; many people have any amount of learning but are incapable of applying it. At the opening of the discussion Dr. Maria Montessori stressed the importance of the early years of life, and of endeavouring to bring the child into social life from the first and not to leave it isolated.

Maternal and Child Psychology at Clinics.

The two practical suggestions which emerged from the discussion were the value of periodical talks at the centres with groups of mothers on the treatment and upbringing of their children, and talks with individual expectant mothers about their moods and mental troubles. Dr. Alice Hutchison, of the Tavistock Clinic and Great Ormond-street Hospital, gave her experience of such monthly talks. When they had special evenings for the talks the attendance was poor; lately they had been more successful by adopting the practice of occasionally closing the clinic early so as to give time for a talk. Dr. Grace Calver related her encouraging experience of talks to expectant mothers. Lady Erleigh pointed out the importance of thoroughly investigating the cause when a child did not fit into its family environment. If a child was persistently naughty, the mother should say to herself, "What is wrong with me?" One speaker thought psychology was an unfortunate word. The general impression seemed to be, however, that it was a convenient word to retain for the use of the workers in the movement, as long as it was clearly understood that it implied "the proper handling of human beings as individuals and not as herds."

The Problem of Maternal Mortality.

The third and fourth days of the School were devoted to the consideration of maternal mortality and morbidity, under the chairmanship of Sir Arthur Newsholme. The subject was ably reviewed at the outset by Dame Janet Campbell, and various aspects of the subject were dealt with by other lecturers. Dr. A. E. Giles spoke on preventive medical measures and Dr. Mabel Brodie (welfare medical officer, Durham County) on the social aspect of preventive measures. Dr. R. A. Lyster dealt with the midwives' part, and the point of view of the medical officer of health was considered broadly in a paper by Prof. E. W. Hope.

In the discussion which followed it was made clearly evident that we have a very long journey to travel before we reach a satisfactory midwifery service for the country. Some of the points emphasised were the quite inadequate instruction in obstetrics received by the medical student, the need for better education of the midwives, and for a great extension of antenatal clinics conducted by medical practitioners with an expert knowledge of obstetrics. Dr. S. G. Moore claimed good results for the voluntary notification of pregnancy in force in Huddersfield. Since 1916 the maternal mortality in childbirth in Huddersfield had been 5.01 per 1000 births, but it had been only 2.59 among the "notified" as compared with 6.18 among the "unnotified." Dr. A. F. G. Spinks (Newcastle-upon-Tyne) was also in favour of the notification of pregnancy. Sir Arthur Newsholme deprecated pessimism and pointed to the improvement since the Midwives Act of 1902 came into operation. He also referred to the mistake made when the administration of maternity benefit was put into the hands of insurance committees instead of into the hands of the sanitary authorities. Dr. Harold Waller was very emphatic in his condemnation of the present haphazard ill-organised midwifery service. He said that there was lack of organisation among the London maternity hospitals. Every borough should have its lying-in hospital beds with a complete obstetrical staff for dealing with in-patients and patients treated at home. The women of this country had forced an unwilling medical profession to take measures to save the lives of infants; they

must be prepared to do the same for the sake of the mothers. Dr. Elizabeth Macrory referred to the approaching transfer of the Poor-law hospitals, and suggested that each of these hospitals should have wards allotted to maternity work, staffed by skilled obstetricians, who would conduct antenatal clinics and act as consultants both to general practitioners and to midwives. Dr. Dunstan Brewer claimed good results in Swindon from the early investigation, with the coöperation of the practitioner, of puerperal rises of temperature. During the last five years they had had 5000 births in Swindon and no deaths from puerperal sepsis. As a rule, when a rise of temperature occurred during the puerperium doctors and midwives tried to "explain it away," not to explain it. Miss Rosalind Paget put forward suggestions on behalf of the Midwives' Institute: 1. Birth notifications to state the name of the person who actually delivered the patient. 2. A post-mortem to be held on every woman who dies at childbirth. 3. Internal examinations to be made only by medical practitioners or certified midwives. 4. All medical officers of health in dealing with childbirth mortality to be asked to differentiate between doctors' and midwives' cases. 5. Doctors to be asked to employ midwives as maternity nurses. Midwives were feeling the competition caused by the establishment of so many maternity hospitals. 6. The administration and staffing of many maternity homes needs drastic amendment. 7. There is a lack of good consultants for midwives.

CANADIAN PUBLIC HEALTH ASSOCIATION:

THE MILK SITUATION IN CANADA. (FROM OUR OWN CORRESPONDENT).

At the fourteenth annual conference of the Canadian Public Health Association, held in Montreal last month for two days, under the chairmanship of Dr. A. Lessard, Director of the Provincial Bureau of Health, Quebec, the subject of infant welfare was discussed in almost all its aspects, but the subject of perhaps the most general interest was the reading and discussion of the report on the milk situation in Canada by a committee of the Canadian Public Health Association. The committee was appointed on Dec. 1st, 1924, to make a study of "milk problems" and to report the findings and recommendations of the committee at the next annual meeting of the Association. The committee named was as follows: Dr. M. M. Seymour (chairman), Regina; Dr. T. A. Starkey, Montreal; Dr. J. A. Amyot, Ottawa; Dr. H. W. Hill, London; Dr. C. J. C. O. Hastings, Toronto; Dr. L. L. Demers, Montreal; Dr. A. J. G. Hood, Montreal; Dr. A. J. Douglas, Winnipeg; Dr. Arthur Wilson, Saskatoon; Dr. F. T. Underhill, Vancouver; and Dr. R. H. Murray (secretary), Regina. All the members of the committee are provincial and city health officers, with the exception of the secretary and Dr. Starkey, professor of hygiene, McGill University. Among the various points of interest in the report it may be noted that the average consumption of 21 Canadian towns which have reported on this feature of the supply showed a per capita consumption of 0.71 pint per day. The per capita consumption of the city of New York in 1923 was 0.54 pint per day. While statistics regarding the relationship of disease to milk in Canada are largely lacking, the report states that the fact remains that milk has been the means of causing more disease than any other single food, and consider it as much the duty of the local health authority to safeguard the milk-supply as it is their responsibility to provide a safe water-supply for the citizens.

Pasteurisation.

Perhaps the most instructive part of the report is that which refers to pasteurisation of milk. In

Canada, with the exception of Quebec, Vancouver, and Victoria, all the larger Canadian cities and towns are in favour of compulsory pasteurisation, and the Provincial Health Departments of Quebec, Ontario, and British Columbia have declared their belief in the efficacy of this mode of dealing with milk. However, it is pointed out that, while theoretically it is most desirable that all milk offered for sale to the public be pasteurised, it is difficult, and in fact practically impossible, to carry on pasteurisation as it should be done in communities with populations of less than 5000. The point is emphasised that any attempt at commercial or unscientific pasteurisation is worse than no pasteurisation, inasmuch as it tends to create a false sense of security on the part of the consumer. According to this report, the consensus of public opinion to-day is that the milk supplied to all urban centres should be pasteurised. But if a city or town is not sufficiently large to warrant the establishment of a modern pasteurising plant, other means must be found to protect the supply or to provide such a plant. It is the opinion of members of the committee that the public must be educated to appreciate the necessity for pasteurisation of milk-supplies, and the question is how the public is to be educated. Various suggestions are made.

Education of the Public.

It would appear, says the report, that the first step towards introducing successfully any sanitary reform in Canadian communities is not so much the education of the public as the education of the medical profession, by whom the public still seem to be guided in such matters, rather than by public health officials. Therefore the committee recommend intensive and continuous propaganda in this direction by every available agency. Testing of herds by tuberculin is recommended for rural districts, although the committee state that it must be clearly understood that tuberculin testing is not an efficient substitute for pasteurisation, and public health authorities must seek to correct the idea which is growing in the public mind in Canada that pasteurisation and tuberculin testing are alternative methods of protecting milk-supplies. The vexed question of certified milk is reported on by the committee, but the matter appears to be in so confused a state that no reliable data are forthcoming, and consequently no definite statements are made. The question, too, of inspection and laboratory control in Canada is unsatisfactory. The report says: "It is doubtful if there is any municipality in Canada with a population of less than 3000 which has a trained dairy inspector to protect the milk-supply."

Conclusions of the Committee.

The conclusions of the committee are that pasteurisation of milk should be encouraged by every practicable means. The following standardised definition for pasteurised milk is recommended by the committee for use throughout Canada: "Pasteurised milk is milk which has been heated to a temperature of not less than 142° F. and not more than 145° F., kept at such temperature for not less than 30 minutes, and then immediately cooled to a temperature of 50° F., and kept at or below this temperature until delivered to the consumer." The committee contend that safeguarding the milk-supply is as much the duty of a municipality as safeguarding the water-supply, and in view of the efficacy of pasteurisation, in their opinion, in preventing outbreaks of milk-borne disease in large centres of population, they hold that municipal authorities should provide and work pasteurisation plants for the benefit of the dwellers in municipalities. This milk report is a valuable and lengthy document, which is well worthy of a close consideration. Its salient feature is its whole-hearted advocacy of pasteurisation, when scientifically carried out, which seems to be regarded by the members of the committee as the only really reliable practicable means at present known of ensuring a fairly pure milk and of warding off disease by the agency of milk.

Among those who read papers at the conference and took part in the discussions on the various matters were Dr. Helen McMurchy, chief of the Division of Child Welfare, Department of Health of Canada; Dr. A. B. Chandler, Child Welfare Association, Montreal; Prof. Raoul Masson, University of Montreal; Hon. Dr. W. F. Roberts, Minister of Health for New Brunswick; Dr. Eugene Gagnon and Dr. A. Plante, Child Hygiene Division, City Health Department, Montreal; Dr. John W. S. McCullough, chief officer of health for Ontario; and Prof. J. G. Fitzgerald, University of Toronto.

Public Health Services.

SCHOOL MEDICAL SERVICE.

STATISTICS from two school medical reports for 1924 are given in the following table:—

Name of district.	No. on roll.	Av. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Nottingham ..	41,349	37,690	12,204	37,600	13.5
Sheffield. . .	81,197	72,416	23,485	107,494	17.5

* Excluding dental defects and uncleanness.

Nottingham.

School medical officers generally will support Dr. E. M. Wyche in his plea for a quiet, well-lighted, warmed, and well-ventilated room in which to examine school-children. The conditions at present under which such examinations take place in nearly all areas are crude and often necessitate a further examination at some distant clinic, entailing a loss of time for the doctor, nurse, and parent as well as a loss of school attendance for the child. Dr. Wyche discusses practically all the scheduled defects and points the way to ameliorate or even eradicate much of the present morbidity. Hypermetropia being the normal condition in childhood will always be with us, but myopia can to a certain extent be checked by early recognition and treatment followed by sound and sensible school hygiene. Defective dentition often takes its origin in the malnutrition of the mother prior to the birth of the child, so prophylaxis starts with the maternity and child welfare scheme. Mr. H. B. Tawse, the aural surgeon, stresses the necessity of early recognition and treatment of morbid throat and nose conditions which can be done by fully coördinating the welfare services with the school work. The altered attitude of the parents towards remedial methods is all to the good. The Board of Education have shown their appreciation of the work already done in Nottingham by appointing it one of the centres for investigating the causes of enlarged tonsils and adenoids.

Statistical evidence of the progressive value of the school medical work is evidenced in comparative tables for the past few years. Uncleanness has diminished from 15 per cent. in 1921 to 13.3 per cent. in 1924, tonsils and adenoids from 11.9 per cent. in 1918 to 3.5 per cent., ringworm from 725 cases in 1913 to 297 cases in 1924. Dental defects are now 55 per cent. as against 75.6 per cent. in 1918. Scabies and impetigo, the fellows of dirt and neglect, are rapidly diminishing coincident with an increase of self-respect and well-being which go with cleanly and healthy habits.

A new open-air school with accommodation for 140, and up to date in every respect, is now to be added to those already in existence; this will spread the gospel of fresh air and sunlight and bring happiness, health, and vigour to many ailing children. The

education committee are now considering the question of supplying an ultra-violet rays machine to augment the work of the open-air schools. The success of a camping holiday during August, 1924, which enabled 209 boys to enjoy the "jolliest week of their lives," has prompted Dr. Wyche to submit to his committee that such a camp be organised every year for a period longer than a month with a proper educational curriculum and that girls should benefit equally with the boys. In an inquiry undertaken by Dr. Wyche and the senior assistant, Dr. A. A. Newth, they found that the average educational gain in one year for dull and backward children taught in special classes was 11.9 months—a very favourable result when we remember that the normal child may be expected to advance educationally 12 months in each year. Averaging results amongst small numbers scarcely gives conclusive proofs, nevertheless the increase in educational attainments amongst individually taught dull and backward children distinguished them from definite mental defectives with whom no such results are obtainable. Tribute is paid to the loyal and helpful coöperation of the teachers, attendance officers, and many voluntary bodies by whose aid much remedial work has been made possible.

Sheffield.

The report of Dr. T. Chetwood contains a large number of interesting points usually summarised in a few concise sentences. The general characteristics of the area seem to be expanding work well carried out with a barely adequate staff and a need for the further extension of institutions like the clinics. The percentage of defects found is only slightly below the average, while the percentage treated (95 per cent.) is strikingly above that of previous years (e.g., 67 per cent. in 1914) and is hardly to be improved upon. The only treatment where efficiency is open to any doubt is that of nose and ear conditions for which no clinic is provided by the authority. A line or two in the introduction gives the welcome information that a local medical committee which is studying epidemic encephalitis has the school medical officer as a member. On this subject the school medical service can contribute greatly to general medical knowledge.

A brief but authoritative account of some special observations shows that in nutrition and weight the Sheffield children are now below the pre-war standard. This is the case in some but not all other areas, and it may be related to the circumstance that Sheffield has more than its fair share of unemployment. Defective vision receives some significant comments, such as the reference to its much greater frequency in secondary schools and the influence of home-work.

A special investigation was conducted on the incidence of squint following measles. This was found to have occurred in 53 out of 1773 cases, or roughly 2.7 per cent. The interest was not merely statistical, for the majority of cases received the early treatment that is so essential. Another matter which has not attracted as much attention as it deserves was the condition of spectacles. A sample of boys in a poor school who should have been wearing glasses were seen monthly by Dr. J. H. Campaign for six months. It was found that only 43.6 per cent. were wearing satisfactory glasses at every monthly examination, and from our own experience we do not think that these results are very exceptional especially when there are included the instances of glasses bent so as to interfere seriously with the optical centring. Reluctant as we are to suggest fresh burdens for the teachers or nurses, we think that the results of a periodic roll call of spectacle-wearers would amply repay the loss of a few moments' time.

Among infectious diseases chicken-pox has called for more notice than usual owing to the prevalence of modified small-pox in areas bordering on the city. The dental work is unfortunately limited by the somewhat inadequate numbers of dentists, but within the limitations the subject seems to be energetically pursued, with some special attempts to

enlighten ignorant parents. At the skin clinic there is noted a very marked diminution of ringworm of a generalised type, attributed to the early diagnosis by the school doctors, nurses, and still more important by the mothers of the children. Special schools are mentioned but seem to contain few children over 14; it will be a great advantage when the promised new school for mentally defective elder boys is set up. Elsewhere this has been found to be a valuable type of school giving the boys stability of character, increase of self-respect, and habits of industry. It is satisfactory to see that dull and backward children are regarded as within the province of the S.M.O.; not only is it his duty to separate them sharply from the mentally defective, but in many cases there are minor defects of the nervous system, sense organs, and the like, which need his special attention.

In conclusion, Dr. Chetwood modestly calls his report imperfect and incomplete. With this statement we are unable to agree. We might wish the report had been longer, but it is certainly not lacking in interest and real value.

MENTAL HOSPITALS SERVICE.

THE annual report of the *East Sussex County Mental Hospital at Hellingly* includes the reports of the visiting committee, resident physician, dental surgeon, resident engineer and surveyor, the commissioner of the Board of Control, and the various visiting committees of the guardians and other public bodies concerned with the institution. It concludes with statistical tables showing the movement of the asylum population, the recovery- and death-rate, ætiological factors, and the forms of mental disorder. A visiting ophthalmic surgeon has been appointed, an operating theatre is projected, and it is the intention of the committee to appoint a whole-time pathologist with a trained assistant. The latter is particularly needed for work in connexion with asylum dysentery, which is still a troublesome feature, although the number of cases has diminished during the past year. Apart from a small epidemic of mumps, the staff are able to congratulate themselves on an entire freedom from zymotic disease. The medical superintendent points out the large number of senile cases admitted. The attention of the guardians has already been drawn to the desirability of providing the custodial care, which is all that is required for such people, in the workhouses, thus rendering the patients much happier and leaving the mental hospital accommodation free for recoverable cases. Dr. F. R. P. Taylor gives an interesting table showing the desirability of placing mental patients under treatment as early as possible. This aspect of the work is represented by the attendance of Dr. Taylor at the clinic for nervous disorders at the Princess Alice Memorial Hospital in Eastbourne, although it is desirable that this valuable clinic should reach patients over a wider area of the county than at present. The asylum itself is able to show a satisfactory recovery-rate of 33 per cent. for the males and 42 per cent. for the females. The death-rate, also, reached a record of only 6.6 per cent. in the year. The dietary scale has been revised in a careful and ingenious way, so as to allow ample variety of food without increase in cost. It is satisfactory to note that an increasing proportion of the nursing staff are equipping themselves with the nursing certificate of the Medico-Psychological Association, and the committee has decided to appoint a sister-tutor to aid them in their studies.

The *Cumberland and Westmorland Mental Hospital* is unique in that the greater proportion of its 800 patients are male. This is partly accounted for by the conditions of population, but seems an interesting point that might repay further investigation. The number of admissions during the past year dropped to the lowest on record; most of those were hopeless cases and many of them senile. Nevertheless, a recovery-rate of 42.7 per cent. is recorded—a good

figure under the circumstances. The hospital has been free from all epidemic diseases except influenza. The parole system is used with much success as a preliminary to discharge.

The *Cheshire Mental Hospital at Parkside* reports a successful year of work with a death-rate of only 6.2 per cent., in spite of epidemics of influenza and some sporadic cases of dysentery and tuberculosis. A particular feature of this hospital is the occupational therapy, which is under the charge of a special worker, and includes all kinds of healthful and useful activities, organised games, drill, raffia-work, rug-making, and so on. 77 patients have been instructed in some kind of handicraft during the year, and the value of such stimulus in the treatment of mental disease is indisputable. 136 male and 60 female patients have been allowed out on parole, and advance has been made in the employment of open-air and hydrotherapeutic methods. Since the publication of the report arc lamps for artificial sunlight treatment have been installed, and new verandahs provided to the wards. In the laboratory a routine investigation of the endocrine system is in progress, and also research on the superficial vascular system and its reactions in mental disease. Several of the nurses have been allowed leave in order to undergo two years' training in general nursing, an experience which must very considerably increase their efficiency as mental nurses. Female nurses have been successfully employed in the sick-wards on the male side. The report includes a note by the chaplain, who pays a tribute to the devotion and patience of the nursing staff. It is clear that Cheshire may congratulate itself on having one of the most progressive mental hospitals in the country.

The *County Borough of Middlesbrough* maintains some 450 patients in its mental hospital; 60 per cent. of these are usefully employed, and parole and day-leave are used as freely as possible before discharge. The institution has been free from dysentery and enteric fever, and has suffered only from the universal influenza. There is at present no dental surgeon, a defect that will, no doubt, be soon remedied. The recovery-rate reaches the figure of 41.7 per cent. and the death-rate 8.4 per cent. At present the work is somewhat handicapped by the need for a pathological laboratory and for an admission ward, in order that new cases may not have to associate with old and incurable patients.

The *City of Leicester* maintains an excellent mental hospital for 900 patients at *West Humberstone*. The year's work has been as successful as such work can ever be, with a recovery-rate of 44.5 per cent. and a death-rate of 6.7 per cent. There has been complete freedom from tuberculosis and zymotic disease. 77 per cent. of the patients are usefully employed, and every variety of entertainment is provided for them. They run a quarterly journal of their own without assistance; 20 per cent. of them wear their own clothes, and the garments provided by the institution show a refreshing individuality in cut and pattern. It has been found possible to allow 40 per cent. out on parole or leave, and only four cases have abused this privilege. A visiting dentist has been in attendance for two years, and is on a fair way to achieving his ideal of clean mouths in all patients. The malarial treatment of general paralysis has resulted in recovery and discharge in 21.7 per cent. and marked improvement in a further 13 per cent. The medical superintendent places biological stress first of all the causes of mental disease, followed by heredity, syphilis, and epilepsy. It is interesting to note that the ratio of insanity to the population of the town is now only 1:331, whereas ten years ago it was 1:320.

The *County and City of Worcester Mental Hospital at Powick* supports 1000 patients. The death-rate during the past year has been 7.58 per cent., partly owing to an epidemic of influenza. The nurses are encouraged to work for the certificate of the Medico-Psychological Association. Parole has been granted

to some male patients. The report includes notes by the Anglican and Roman Catholic chaplains, and some interesting statistical tables showing the movement of the hospital populations, the discharges, recoveries and transfers, and causes of death.

The *Glasgow Royal Asylum* presents its 111th report for the year 1924. Its age has not debarred it from keeping abreast with all modern advances in the treatment of mental cases. Voluntary boarders are steadily on the increase and now constitute 50 per cent. of the inmates. Occupational therapy is being extended as rapidly as possible under a skilled instructress, the aim being to make the patients self-supporting. The patients are taking great interest in the work, which includes all kinds of handicrafts, such as chair-covering, basket-making, china-painting, rug-making, &c., and necessitates a sale twice yearly to dispose of the products. A nursing home for incipient cases has been established, and the physician-superintendent urges the need for further co-operation between the profession and public, and education of the latter in the problems of mental disease. Forty-four out of 118 cases admitted had had symptoms for over a year before seeking skilled treatment; the importance of out-patient work, social service, and home care is not yet adequately realised. In Dr. D. K. Henderson's opinion there should be wards for acute mental cases in all general hospitals. The pathological side of the work is looked after in the Western Asylums Laboratory, where research is being conducted on the influence of toxic factors in mental disease, and the effect of combined protein shock and arsenic in general paralysis.

The second report of the *Inspectors of Lunatics for Northern Ireland* is for the year 1923, and deals with 4000 patients in the various asylums of the country. The death-rate has fallen to 8.3 per cent., from the high figure of 12.3 per cent. recorded for 1922. At Antrim it has been found possible to employ an increasing number of inmates, but the staff are not yet adequately trained. Belfast, in common with several English mental hospitals, has tried the experiment of using female nurses in male wards, and is satisfied with their success. Londonderry is handicapped by old and inadequate buildings, and has a death-rate of 10 per cent. The voluntary boarder system does not yet seem to have been adopted in Ireland. The report contains valuable statistics of the causative factors, causes of death, cost of maintenance, &c.

The annual report of the *City of Cardiff Mental Hospital* contains statistical tables, the reports of the visiting committee, medical superintendent and commissioner, and a list of the original papers published by the officers of the institution. An interesting feature of the medical report is the inclusion of observations by the various research workers on the experiments they have conducted. A large series of blood-sugar estimations has been carried out in epileptics and paralytics, and a report has been made to the Medical Research Council on this subject. The effect of adrenalin and of adrenalin with thyroid or thyroxin on the blood-sugar of rabbits has also been studied. The therapeutic effects of tryptarsamide were investigated in four cases of dementia paralytica. The examination of gastric digestion in early and recent cases has been continued, and a large number of routine tests have been performed. The estimation of phosphorus and calcium in blood and cerebro-spinal fluid has led to the evolution of a procedure which estimates phosphorus with an error of not more than 5 per cent. The Boltz test is being applied, and seems likely to prove a simple and satisfactory method of diagnosing neuro-syphilis. The treatment of epilepsy by luminal and dialacetin has proved satisfactory. A gynaecologist and rhinologist have been appointed to the staff, and the consulting dentist has made over 500 examinations. There are well-equipped radiographic and hydrotherapeutic departments. The out-patient clinic at the Royal Infirmary

is continuing its work, but is handicapped by the lack of any in-patient accommodation. A sister-tutor has been appointed and the control of the male wards has been placed in the hands of the matron.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 27TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 68; scarlet fever 1315; diphtheria, 799; enteric fever, 56; pneumonia, 637; puerperal fever, 29; cerebro-spinal fever, 5; acute poliomyelitis, 1; acute polio-encephalitis, 1; encephalitis lethargica, 49; dysentery, 6; ophthalmia neonatorum, 116. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 3 deaths from enteric fever, 63 from measles, 9 from scarlet fever, 58 from whooping-cough, 24 from diphtheria, and 23 from influenza. In London itself the deaths from influenza numbered 2, from whooping-cough 12, and from diphtheria 5.

Obituary.

THOMAS MARK HOVELL, F.R.C.S. EDIN.,
CONSULTING AURAL SURGEON, THE LONDON HOSPITAL.

WE have already announced the death of Mr. Mark Hovell, the well-known laryngologist, which occurred on July 1st at the house of a relative in Ipswich after a somewhat protracted illness.

Thomas Mark Hovell was born in 1853, but until recently his youthful appearance and active manner belied his age. He was the son of Mr. Dennis de Berdt Hovell, a well-known practitioner in the north of London, and in his day President of the Clinical Society. His mother was Mary de Horne, who came of an old Flemish Quaker family, and on both sides he was able to trace an unusually long pedigree. He was the second child in a family of ten, and inherited the family property. He received his education at Guildford Grammar School and later at the medical school of the London Hospital, qualifying as M.R.C.S. in 1875 and taking later the F.R.C.S. of Edinburgh. He decided early in his career to take up the subject of diseases of the nose, throat, and ear, at that time fairly new as a definite specialty, and was elected surgeon to the Golden Square Hospital as quite a young man. At this hospital the leading spirit was Sir Morell Mackenzie, who, in 1887, took charge of the German Crown Prince, later the Emperor Frederick III. of Germany, whose throat symptoms were already causing great anxiety. This anxiety, in the political circumstances of the time, was shared by the whole world, and the circumstances imparted into the treatment of the Crown Prince a most unhappy element of fierce quarrelling. There is no need to recall the acrimonious differences of opinion which manifested themselves between the patient's medical attendants during the various stages of a disease which ultimately proved fatal. In those disputes Hovell was only implicated in a secondary position, when he accepted Mackenzie's invitation to take resident charge of the distinguished patient, whom he accompanied to San Remo and later to Berlin, where he was in daily and hourly attendance until the end came in the summer of 1888. His records of the progressive condition formed the clinical history of the case, but their evidence, as far as they proved the contentions one way or the other of those who disputed both the diagnosis and the treatment, he left for evaluation to the protagonists in the dispute. He took little or no part in the arguments, but the skill and sympathy with which he discharged his duties as resident surgeon were admitted on all sides, and were specially acknowledged by the patient who conferred upon Hovell the German Order of the Crown immediately upon his accession to the throne.

Upon his return to England Hovell was appointed lecturer on diseases of the throat at the London Hospital, was regularly attached to the staff of the hospital for many years as aural surgeon, and was appointed consulting surgeon at the expiration of his active functions. He was also consulting surgeon to the Golden Square Hospital, and wrote out of his wide personal experiences a treatise on diseases of the ear and naso-pharynx, which was a standard work for many years. He acquired a large consulting practice and his advice was much valued by practitioners, who saw in him a man of much and varied personal experience. In private life he was the kindest and most hospitable of men.

Outside his medical work he conducted for many years an intensive inquiry into the manners of rats. His book "Rats and How to Destroy Them," which was published last year, is a record of patient study extending over some 30 years, and reveals an intimate knowledge of the habits of rats in most conceivable circumstances, showing also how in each particular their persistent assaults can be defeated.

Mr. Mark Hovell married in 1905 the Hon. Margaret Bateman-Hanbury, a daughter of the second Lord Bateman, by whom he had one son.

CHARLES FORBES HARFORD, M.D. CAMB.

Dr. C. F. Harford, the founder and first Principal of Livingstone College, Leyton, died suddenly on July 4th at his residence in Harpenden, aged 60. The youngest son of the late Canon Harford-Battersby, Charles Harford was educated at Repton and Trinity College, Cambridge, and studied medicine at St. Thomas's Hospital, London. He obtained the M.R.C.S. and L.R.C.P. in 1889, and graduated M.B., Ch.B. Camb. in the same year, gaining the M.D. in 1892. On qualifying Dr. Harford went as a medical missionary of the Church Missionary Society to Lokoja, West Africa, returning in 1893 to found the College that offers a training in the elements of hygiene to missionaries before leaving the country. In medicine he devoted himself particularly to the specialty of ophthalmology, and at one time held the posts of ophthalmic assistant at St. Thomas's Hospital and at the Royal London Ophthalmic Hospital. During the war he acted as ophthalmic specialist, holding the rank of Captain in the Royal Army Medical Corps, and subsequently gave his services in that capacity to the Ministry of Pensions, Chelsea. At the time of his death he was refraction assistant at St. Bartholomew's Hospital and oculist to the school clinics of the London County Council and the county of Hertfordshire.

A colleague writes of him: "Dr. Harford's unexpected death will be a blow to many besides his intimate friends. The work which he did as honorary secretary of the Ophthalmic Benefit Committee was undertaken for the good not only of his profession, but, as he firmly believed, for that of the public. During the last six months he had become known to many of his fellow ophthalmic surgeons in this connexion, and it is pathetic that he should be taken just at this moment when his efforts appear likely to bear fruit."

Dr. Harford was an enthusiastic advocate of temperance, and for many years was honorary secretary of the Native Races and Liquor Traffic United Committee, and in 1919 was secretary to the Church of England Temperance Society. He also filled the office of joint secretary in the Society of Tropical Medicine and Hygiene. He is survived by his widow and one daughter.

NAVAL MEDICAL COMPASSIONATE FUND.—At the quarterly meeting of the directors of this Fund, held at 68, Victoria-street, London, S.W., on July 7th, Surgeon Vice-Admiral Joseph Chambers, Medical Director-General of the Navy, in the chair, the sum of £65 was distributed among the several applicants.

INTERNATIONAL CONGRESS OF RADIOLOGY.

THE first International Congress of Radiology was held on June 30th and July 1st, 2nd, 3rd, and 4th, at the Central Hall, Westminster, under the presidency of Dr. C. Thurstan Holland.

The Congress was attended by about 350 delegates, hailing from the Argentine, Belgium, Canada, Czechoslovakia, Denmark, France, Germany, Hungary, Holland, Iceland, the Irish Free State, Italy, Norway, Poland, Russia, Sweden, Switzerland, and the United States.

FORMAL OPENING BY H.R.H. THE DUKE OF CONNAUGHT.

H.R.H. the Duke of Connaught opened the proceedings and extended a welcome to the foreign delegates in the large hall. Prior to his speech, representatives from each country were introduced to him. The Duke reminded his hearers that it was now 30 years since Röntgen discovered X rays, and said it was a great tribute to the value of this discovery that in 1925 such a large body of medical men and scientists should have met to discuss further developments of it. The use of the rays to detect faults in steel was now an established procedure, and their application to coal was also making progress. In diagnostic and curative ways, too, the rays had given relief to countless thousands, but further research was needed before the value of the rays in the treatment of disease could be accurately assessed. The consuming question in the minds of medical men and scientists was the cause and treatment of cancer, and such meetings as this for the interchange of ideas and experiences could only be for the common good, besides their mission in fostering cordial international relationships. Not all smaller hospitals were able to have an X ray equipment, and he expressed admiration of the effort being made by the British Red Cross Society to provide the services of mobile X ray units, which could be taken to the bedside of patients. His Royal Highness also referred to the recently formed British Institute of Radiology, the aims of which were to promote friendly relations and the exchange of ideas with other radiological centres throughout the world, to look after the interests of all who were associated with radiology, and to organise teaching and research. In France very valuable work was being carried on, largely by the aid of Government grants for the purchase of large quantities of radium, and Belgium was very energetically prosecuting research into the properties and possibilities of these agents; while in Germany there had been established a definite technique for particular diseases. In this city, he said, we had the Radium Institute, which was employing a large quantity of radium; and the Government had placed at the disposal of the Medical Research Council a large quantity of the salt, which was distributed to a number of hospitals and research centres. The British Empire Cancer Campaign had also been interested in radium and X ray research, and had granted considerable sums of money for approved schemes of research and the supply of radium to centres. In addition the Ministry of Health was conducting inquiry into the results of the treatment of cancer, and it was hoped that as a consequence of this large quantities would be placed at the service of the medical profession. In declaring the Congress open, His Royal Highness said he prayed that every success would attend its labours.

Welcome by the Minister of Health.

The Right Hon. Neville Chamberlain, M.P. (Minister of Health), followed with a speech of welcome on behalf of the Government. He said it was not very surprising that this should have been the first international congress on the subject, seeing that radiology was still in its infancy. When Röntgen made his

discovery 30 years ago, only those in close touch with scientific questions could have anticipated what that discovery would yield for the service and benefit of mankind. Very considerable progress had been made of recent years in regard to the application of X rays, radium, and sunlight in the diagnosis and treatment of disease; but each new discovery only seemed to raise the curtain a little higher and to reveal the possibility of even further discoveries. He did not believe that real advance could be made except by the interplay of minds which were continually being devoted to these problems. It was the duty and the policy of this country to do all it could to stimulate and encourage research. At the present time radium was both scarce and dear, and until someone showed how it could be made out of house refuse, or beetroot, he supposed there would always be a difficulty in securing a sufficient quantity of the precious substance.

The path of exploration, Mr. Chamberlain said, had always been strewn with wreckage, and often the explorers in the field of radiology had been no exception in that respect. Earlier in the inquiry regarding these substances and sources of power men had fallen victims to dangers which at the time were unsuspected. All honour to those martyrs who had so suffered, some of whom had lost their lives in the work. It was, however, a comfort to those who suffered in the acquisition of knowledge to feel that they had at any rate buoyed the rocks for others, and through them had prevented suffering by many thousands of fellow creatures. He believed that by the holding of such congresses further triumphs for the benefit of humanity would accrue.

Sir Humphry Rolleston expressed the thanks of the Congress to the Duke for his kindness in performing the opening ceremony, and referred to the close association of this Congress with the British Institute of Radiology, which carried on work in this sphere steadily from day to day. The Institute deserved all possible encouragement, as it was a kind of central bureau where all matters concerned with radiology could be stored, discussed, and provided for the use of any medical man desiring it. It was also a centre of instruction for the men who were taking up radiology as their life-work, as a preliminary to taking their diploma. In addition it was to be the home of the Mackenzie Davidson Library, and the site of a museum in memory of the late Sir Archibald Reid, who had done so much for radiology, particularly during the war, and was a moving spirit in the foundation of the Institute. The Institute would also be a meeting place for colleagues from foreign countries, the Dominions, and the Colonies.

The work of the Congress was carried out in three separate sections—Physics, Electrotherapy and Actinotherapy, and Radiology, of which the respective chairmen were Mr. C. E. S. Phillips, Sir Henry Gauvain, and Dr. A. E. Barclay.

INTERNATIONAL UNITS AND STANDARDS FOR X RAY WORK.

This important question was discussed very fully by a combined meeting of the Sections of Physics and Radiology.

Sir William Bragg, F.R.S., in opening the subject, said that in order that a science might progress it had always been necessary to render comparison of results easy. Lord Kelvin had well said that nothing really progressed until it had been put into terms of arithmetic. The subject of X ray standards was beset with real difficulties, perhaps more so than the choice of any other unit which science had had to devise. One of the greatest difficulties was that due to the difference between quantity and quality, the difference between the amount of energy and the wave-length which carried it. Nor was the subject simplified by the occurrence of scattering of the rays and the consequent formation of new beams. These difficulties made it all the more desirable that the workers in all countries should meet and arrive at an understanding as to the best method of comparing

the results arrived at. Various countries had already been working at the problem, and he was a member of a standing committee appointed by the Röntgen Society and the Physical Society to study the question. To arrive at such an understanding no undue stress must be laid on any one part, for a standard must be largely a matter of compromise. Three grades could be set out: (1) The determination of a scientific unit; (2) a description of a standard apparatus for making comparisons; (3) a comparison of the results of treatment. The last of these was entirely a hospital matter. There seemed no reason why these three problems should not be attacked together.

Dr. Bécère (Paris) said the erythema dose was a biological unit, and took the place of all the physical units previously employed. But the sensitivity of the skin varied within quite wide limits. This, however, would not be so important in regard to dosage if all radiotherapists had adopted the same average value—i.e., the same "h. e. d." This was found to vary not only in the same university, but also in the same clinic according to the apparatus concerned. He regarded the skin erythema dose as an unfortunate standard; there should be a physical unit, common to all countries. A feature of weakness in the ionometric method was the difference in the various electrometers. The German Röntgen Society adopted a unit which was based on the electrostatic unit, as well as that chosen by Villar. The chief need at the moment was that radiologists in the different countries of the world should admit the necessity of standardisation of dosage, and proceed to elect an international committee to study the question and submit such a working standard, to embrace not only the quantity to be given, but also the quality of the rays.

An International Quantitometric Unit.

Dr. I. Solomon read a paper on this subject, in which he said the ionometric was the best method of measuring X rays. It was necessary to express the quantity of X rays in terms of a dosimetric notation of an objective character. The choice of a quantitometric unit instead of the electrostatic unit, with the definite conditions proposed by Behnken and adopted by the German Radiological Society, was in fact very satisfactory; but Behnken had shown that differences in technique would prevent its generalisation.

Dr. Behnken stated, in German, what were the points of value in his suggestion. A paper was also read which had been sent by Prof. H. Martius and Dr. Grebe, of Bonn, on the dosage of X rays in absolute units, and the quantity of radiation necessary for the production of skin erythema. Experiments with a Behnken chamber on one side, and one with air at atmospheric pressure on the other, and the difference in these two conditions was found to be very slight. Neither was there much difference when chambers of 10 and 25 cm. diameter were used. The difference between the values for the production of skin erythema, however, was one which needed to be cleared up.

Dr. Altschul (Prague) said a dosimetre was required which would indicate the dosage at each moment of the irradiation, and he described an instrument which would measure the work of a beam of rays.

Dr. N. S. Finzi seconded the resolution, calling for a standard unit of X ray dosage. The proposed committee, he said, would have to determine first a physical unit, then, if possible, a biological unit. The first of these could readily be settled if questions of priority and country of origin were left out. It was not the first unit which was required for adoption but the best. The question of a biological unit was a far more difficult one, because of the number of factors which must necessarily come in. The biological unit would probably vary with the wave-length of the radiation employed, and with the time during which it was applied. For example, if one gave half units on two successive days, the result would not be the same as that from one unit given on one day. If radium should be used as the standard, he suggested that all the

beta radiations should be got rid of by a strong electromagnet. In some of the measurements which had been made the beta rays as well as the gamma were used. He also suggested that the committee might consider whether the question of kilovolts of the supply—i.e., the wave-length—should be taken into consideration in determining the unit.

The Chairman (Mr. E. S. Phillips) strongly supported the idea of an international committee to set up a standard unit of X ray dosage, and asked for a vote on the abstract principle. This was unanimously favourable.

Prof. Sidney Russ (Middlesex Hospital) said that now the need for a physical standard in X ray work had been established he did not think much delay would ensue in bringing it about. But one or two considerations needed to be cleared up before finality could be expected. Comparison of the general resolutions of the English physicists with those emanating from Germany showed some differences of opinion as to what was most urgently required. It seemed to be generally agreed that what should be measured was the ionisation in air, apart from any secondary phenomena which might take place in the walls of the vessel, or any electrode effect, or any other effect than that produced in the process of ionisation of the air. But if a beam of X rays was allowed to enter this air space and a certain ionisation resulted, it was difficult to know what was going to happen when a totally different beam entered that space. If those two beams gave the same ionisation it must not be concluded that they were of the same intensity. It was necessary to decide definitely upon some wave-length as that to which further intensive measurements must be referred. A very interesting question was that as to what was the best wave-length to take before making use of a general expression.

Prof. Wintz (Erlangen) said an international standard of dosage was necessary not only for exact work, but also for settling scientific controversies. It was better to take a definite and definable physical unit than an arbitrary quantity of radium as the standard. International agreement was necessary on two points: (a) the fixing of a physical standard unit for measuring primary radiation, (b) laying down principles of measurement for the biological dose. In his own clinic a standard had been in use based upon radium.

Dr. E. A. Owen (National Physical Laboratory) said that since the publication of the first results showing the depth and distribution of Röntgen rays in the human body more experiments had been carried out, and determinations made by the photographic method, as well as by ionisation. There was found to be less scattering of rays around the field in deep doses than for more superficial ones, and the character of the curve in the two was different.

Dr. Glasser (America) said that in his laboratory a large chamber had been used for measurement, and the unit had been measured and practically applied.

Prof. Friedrich (Freiburg) said attempts to measure the X ray energy absorbed within human tissue had not been a success; it was necessary to strive after an absolute physical unit.

Dr. Helfelder (Frankfurt) said he felt suspicious regarding the adoption of any one single ionisation measurement, on account of the number of errors which crept into ionisation measurement. Several must be taken at different times. There was no guarantee of uniformity of the rays used at different places.

Prof. Holthusen (Hamburg) said that in checking two instruments with gamma rays it was not certain that the same results would accrue as with X rays. And it was necessary to distinguish between the unit and the biological effect of a given wave-length.

Prof. Crowther remarked that if the energy of the rays and the wave-length could be measured, the radiation would be known absolutely, both as regards intensity and quality. He hoped to see the unit fixed in terms of radium, and for the reason that the gamma

rays of the latter were so penetrating that the ionisation chamber could never be efficiently shielded from them. He trusted that the proposed international committee would adopt something on the lines of the electrostatic unit, as that was quite definite.

Dr. E. C. Ernst declared that the radiologists in America would be only too happy to help forward this work.

A group to work on this matter was decided upon, with Sir William Bragg as chairman.

PROTECTION OF THE WORKER.

Dr. G. W. C. Kaye (National Physical Laboratory, London) opened a discussion on *Protective and Manipulative Methods in Relation to X Rays and Radium* in the Section of Physics. He referred to the birth of a committee for coöperative action emanating from the Royal Society of Medicine and the Röntgen Society, and said the recommendations made by this committee had been widely adopted, and it resulted in a general raising of the standard. One most important result probably was to end the deplorable list of X ray martyrs, and the active support of the Home Office, the Ministry of Pensions, and Ministry of Health had resulted in the extension of the scope of the Workmen's Compensation Act to include lesions caused by exposure to the rays. In a very busy department protection should be much more elaborate than in a department which used the rays only occasionally. In some of their activities the X ray workers could not be completely shielded from irradiation, as some degree of scattered radiation was unavoidable. Various persons showed a different degree of sensibility to the rays, and indeed the same individual differed in his immunity from time to time. Foolhardiness could never be left entirely out of account in dealing with human beings, but the radiologist, realising the danger of dermatitis, possibly cancer, was not likely to tempt Providence in this matter. He did not, however, always appreciate the result of scattered radiation. Rays were given off from the body of a person who was subjected to X rays, and the scattering produced by the air in the room in the vicinity of the X ray tube was something like that of the primary radiation beam. The primary precaution was to surround the X ray bulb with adequate protective material except just at the appropriate aperture, and in diagnostic work screening was necessary for the protection of the operator. If the scattering was excessive, the operator should be behind a screen or wall, and this scattering rendered inadvisable the use of the cubicle system. Each outfit should be protected by walls extending from floor to ceiling, the floor and ceiling themselves also being protected. The target of the tubes should not be pointed towards the controls. The protecting lead for a strength not exceeding 70,000 volts should be at least 1½ mm. thick, and for 100,000 volts 2 mm. thick, 3 mm. for anything beyond. Usually the manufacturer had risen to the occasion; it was all a matter of design. Dr. Kaye said there was a danger in using gamma rays to test the protection of materials, as these made the protection appear much better than the actual. Always wherever possible the bulb should be surrounded by protective material, and if the latter were lead, it must be adequate for the prevention of sparking. All protective boxes should be tested for leakage. He was surprised that the open bulb was still being used, as in many cases it afforded no protection at all, and where it was employed it was often possible to take a radiogram of the hand in any part of the room. He emphasised the need of providing ventilation of enclosed spaces used in X ray work. Where weight of protective material was a consideration, it was important to remember that lead was the lightest of the protective substances commonly employed. For fluorescent screens not less than 2 mm. of lead was indicated, or 1 mm. for portable screens.

Generous ventilation of the X ray rooms was of an importance only secondary to that of actual physical

protection; failing this, workers suffered from depression, headache, nausea. Sometimes it was difficult to persuade even hospital authorities as to the necessity of this open ventilation. He also thought that by means of bright paint on the walls these rooms should be made as cheerful of aspect as possible. The floor space for the radiologist should be adequate, and should be of wood, cork, or rubber. The ceilings should be not less than 11 feet high, and the conductors at least 9 feet from the floor. Efficient earthing of all the metal parts was also important, and the main switches should be readily accessible, and there should be no possibility of their being accidentally cut off. Seven hours was a reasonable day for X ray workers, with Sundays and two half-days weekly off duty, and a month annual holiday. He proposed that steps be taken to secure X ray unification.

Dr. E. A. Owen said that barium plaster showed an absorption of the radiation which varied greatly with the thickness of the material; he illustrated by graphs that with an increased thickness the character of the curve altered. It was now necessary to use very large protective boxes for ships, so that in some cases they had to be moved about by means of tackle. In the Phillips tube the protective device formed part of the bulb itself, which was the ideal principle.

Mr. Hector Pilon (Paris) read a paper on Protection in Radiotherapy, in which he reminded the meeting that the X ray bulb radiated in all directions, and therefore enclosure in a box was necessary. But all the boxes were of large size. He illustrated and explained an oil-immersed tube, of the same size as the Coolidge universal tube, and which could withstand 200,000 volts on the direct current. Every part of the glass wall was cooled and had the same temperature, thus the life of the tube was lengthened as no part of it had a larger share of work than did other parts. If the box was earthed, the patient ran no risks of receiving an electric shock. Another device was shown by which the tubes could be placed in a lead cylinder, in which they were easily adjustable in any position. The oil itself was an insulating substance.

Dr. V. E. Pullin (London), who was, he said, looking after the question of protection from X rays in 15 service hospitals, also laid great stress on the need for efficient ventilation. Possibly the feelings of depression and the headaches were due to a physiological effect related to the ionisation of the atmosphere. Forced and efficient ventilation he placed second only to primary protection. He related an incident in which several patients in a ward above an X ray room had ulcers on the back after leaving the hospital, and these lesions were undoubtedly due to radiation having reached them through the ceiling. In this case the X ray tube was not boxed. He believed an X ray tube could be run in oil if the direct current was used, but it was difficult to do so with the alternating current.

Dr. H. Moore (Sweden) said that even with efficient mechanical protection one often thanked God for the law of inverse squares, as it was clear that the operator should always get as far away from the X ray tube as possible.

Dr. Pullin seconded the proposal of Dr. Kaye that some steps should be taken to secure X ray unification, and it was carried.

The Organisation of a Hospital Radium Service.

Prof. F. L. Hopwood, D.Sc. (St. Bartholomew's Hospital), read a paper on this subject, dividing it into three sections: the efficient use of the available radium; protection of patient, operators, and assistants against injurious radiation; and the safe custody of the radium itself. The radium of which he had charge was distributed among 220 containers, and he showed slides illustrating the holders for radium needles, threading devices, and magnifiers for reading identification marks on the needles, all conceived to avoid handling the radium, and, indeed, making

this manipulation easier than handling. Protection was afforded by having only a radiologist apply radium, and preventing a patient discharging himself with radium on him. He also showed the ingenious drawers, lead-encased, in which the radium was kept. Track was kept of every needle and every piece of radium, and was accounted for at the end of each day. He submitted a list of regulations operative in the hospital mentioned, and exhibited specimens of the appliances and boxes used.

Mr. F. H. Glew, who has been handling radium for 20 years, pointed out that notwithstanding all the protective devices against radium emanations there were times when one had to face the enemy in full knowledge that he was the enemy. There were moments when the radium would not shake out of the tube, it had become fixed, almost cemented in it, and a small drill was needed to get it out. It would be delightful, he said, if radium burned at the time of touching, instead of the burn gradually revealing itself some time afterwards. After his long experience he was an advocate of the operator even looking at the radium at as long a distance away as possible. There was great difficulty in removing the active radiation from tubes which had once been charged. He deprecated the use of glass tubes in hospitals and busy centres which were ten years old or more, as their critical condition rendered them liable to explode at any time.

Dr. G. Failla (New York) said that in his hospital colour was largely used for the purpose of identifying tubes at a distance. There they had no open wounds to contend with as a result of the manipulation of radium, though the fingers, especially around the nails, became red and scaly.

Dr. A. E. Stein (Wiesbaden) described a medical carbon arc lamp, in which the carbons were placed in parallel series. The arc light was thus formed between the two carbon points which lay one above the other. This position of the carbons enabled the light rays to stream out without any shadowing of the light-crater, which occurred, more or less, in every other form of carbon lamp. The Jupiter lamp was fitted with carbons of a special chemical composition. The result was that these lamps produce numerous ultra-violet rays down to 217, as well as notable proportion of infra-red and heat rays. The spectral values of the light produced by the arc, he held, approached more nearly that of the natural solar rays than those from any other lamp made.

On Thursday afternoon a large party from the Physics Section paid a visit of inspection to the National Physical Laboratory at Teddington.

RADIUM AND X RAY THERAPY.

Dr. S. A. Heyerdahl (Oslo) contributed a paper on the use of radium for *actinomycosis*. In his first case there had been two operations without permanent result, and radium was then tried, and for ten years (to the present date) there had been no relapse. His usual procedure now was to give two or three applications of radium, with a six weeks' interval. The good results lasted for two to ten years.

Dr. F. Tománek, of Prague, who represented the Czech Society of Radiology, related his experiences in treating *pernicious anaemia* with radium, and said that by massive irradiation of the spleen over long periods patients with this condition had been sustained for a long time, even when other treatments, such as blood transfusion, had failed. Radium treatment seemed preferable to splenectomy for this disease. He also read a paper giving his results of prolonged irradiation for *leukæmia*. He used from 80 to 100 mg. of radium over the whole spleen, taking it in 25 sections, giving 80 per cent. of the erythema dose. There was a reduction in the number of leucocytes, the blood picture improved, and at the end of a year no relapse had occurred.

Dr. R. H. Stevens (Detroit, U.S.A.) gave an account of his treatment of four cases of *leukæmia* with intravenous injections of radium during the past year. Three had not been successful, as two of the patients had died, but in the fourth 200 mg. was injected last October with marked improvement and a further dose in January, after which the leucocyte count was normal.

Cancer of the Breast.

Prof. Wintz (Erlangen) read a paper on the *Irradiation of Breast Cancer*. He said that the position of X ray therapy in regard to the treatment of cancer of the breast was still very much disputed. He had now at his disposal the results of fully 300 cases of cancer of the breast, which he had treated by the same method between 1918 and 1924. He urged all experienced X ray specialists to publish their statistics, and asked those who had had experience of a few cases only to send their results to him to be incorporated in the collected statistics which he was about to compile. He advised those compiling statistics to adopt Steinthal's classification. Group I.: Where the tumour was restricted to the breast and can be moved; no infection of axillary or supraclavicular glands. Group II.: Where the tumour had already infiltrated the surrounding region; axillary glands palpable. Group III.: Where the glands in the supraclavicular region were palpable and, in some cases, metastases were also apparent. For the final result cases were arranged in two groups. (1) Lost cases, i.e.: (a) All those who had died whether of carcinoma or of an intercurrent disease; (b) those who could not be followed up; and (c) patients who were at the point of death at the end of the three years whether from cachexia or from distant metastases. (2) Clinically cured cases—i.e., those cases in which after careful examination no trace of cancer could be found and whose general condition was sufficiently good to admit of their being regarded as clinical cures. The following statistics were drawn up on this principle:—

	Treated.	Cured.	Lost.	Percentage of clinical cures.
Group I.	21	20	1	95.2
Group II.	41	28	13	68.2
Group III.	44	8	36	18.1

An observation time of three years, he held, was sufficient, especially when those cases who had died from intercurrent diseases were included. At the same time it was advisable to publish observations extending over longer periods since, in the case of carcinoma, it was correct to speak of a cure only after five years had elapsed. For the purpose of comparison he gave first of all the figures for Groups I. and II. for the three-year observation period.

	Steinthal.	Treated.	Cured.	Percentage.
Three years after treatment	I. and II.	62	48	77.0
" " "	III.	44	8	18.1
Four years " " "	I and II.	47	31	65.9
" " "	III.	36	3	8.5
Five years " " "	I. and II.	35	17	48.5
" " "	III.	11	2	18.8
Six years " " "	I. and II.	28	9	32.1
" " "	III.	10	1	10.0
Seven years " " "	I. and II.	15	3	20.0
" " "	III.	4	—	—

The statistics were similar to those of uterine carcinoma. He said that the results shown by his statistics under Group II. were better than the average results shown by the surgical statistics. Group I. offered ideal competition between the surgical and X ray treatment. If satisfactory results were to be obtained three years after the conclusion of treatment, X ray treatment of the tumour alone was not sufficient. It was essential: (a) to apply the requisite dose for the destruction of the carcinoma cells to the axillary and supraclavicular regions as well; (b) to give a carefully planned scheme of after-treatment; and (c) to take special care when irradiating carcinoma of the breast to prevent lung fibrosis.

Dr. Casman (Antwerp) gave a cinematograph demonstration of the actual burying of radium tubes in the breast in a case of cancer. In cancer in this region he preferred to employ the three processes of X rays, radium, and surgery. From the aspect of pure surgery there were two difficulties—the unsuspected extent of the disease, and the impossibility of surgically removing the whole of it. And it was not always possible to ensure that the needed amount of X ray energy was being absorbed by the new growth. The field for the employment of radium was a more limited one, but the action of this salt was more powerful than X rays. In a given case he began by applying X rays to the whole diseased area. Four or five weeks later he made a small incision and carefully buried radium tubes surrounded by gauze and fixed at a certain distance from the limits of the area dealt with.

Dr. B. J. Lee (New York) reported to the meeting eight cases of primary operable carcinoma of the breast from the special clinic of the New York Memorial Hospital, all of which had been treated solely by irradiation. At least four and a half years had intervened since the commencement of the treatment. Surgery was not employed in this series either because of the patient's age, or in consequence of her refusal of operation. Dr. Lee was somewhat sceptical as to the end-results in the surgery of this breast disease. The oldest patient in the series, aged 90, was made comfortable for three years by this treatment by means of buried radium. At the end of the three years she died from intercurrent disease. The average age of the series was 58. Nodules could be felt in the axillæ of two of the patients. Three women in the series had X ray treatment only. One of them still remained alive, one died two years, the other four years after the treatment. In two radium alone was used, and radium with X rays in the remaining three. One millicurie per c.cm. of radium was the dosage used, while the X rays were administered from a low-voltage tube, with a six-minute exposure, the focal skin distance being 10 inches and the filtration was through 3–4 mm. of aluminium. Of the eight cases dealt with in the paper, five were now alive and well, two had died from intercurrent disease, and one from metastases. The results, he considered, were very favourable as compared with those achieved by surgery in this disease.

Epithelioma of Tongue Treated by Radium.

Dr. C. Regaud (Director of the Pasteur Laboratory at the Radium Institute, Paris) read a paper on curietherapy of epitheliomata of the tongue and their following adenopathy. Of 174 cases so treated 42 were alive and without any symptoms of cancer at the end of 1924, an apparent cure-rate of 24.1 per cent. In 46.5 per cent. the treatment caused at least the disappearance of the cancer at the local site; in the operable cases alone this figure rose to 63.1 per cent. The paper entered into the therapeutic indications and the leading ideas as to technique. X rays appeared to have yielded bad results in cancer of the tongue. Dr. Regaud expressed his preference for radium puncture by means of platinum needles.

Radium Treatment of Cervical Cancer.

Mr. Malcolm Donaldson (London) gave an analysis of the results he had obtained by radium treatment in 85 cases of inoperable carcinoma of the cervix, as reported when he read his paper at the Royal Society of Medicine. He said he had not yet decided whether it would be better to increase the radium intensity or the period of application. He intended that in his next series the number of needles employed should be increased, while the application time should remain at 144 hours.

Dr. Zweifel, of Munich, said he had used in his hospital a combination of radium and X rays latterly, and among the operable cases there had been 43 per cent. of cures, and 7 per cent. among the inoperable.

Prof. Wintz (Erlangen) expressed the view that squamous-celled cervical carcinoma was much more sensitive to X rays than to radium.

ACTINOTHERAPY.

Sir Henry Gauvain initiated a discussion on actinotherapy. He said the chief point to look to was the clinical result of this form of treatment. He believed that the action of light on the patient was two-fold—on the mind and on the body. The experience at the Alton Hospital was that the light caused an improvement in the mental health. On the body the light had a double effect; first the direct one, including inflammatory response and the formation of pigment; secondly, the remote or indirect effects, which he did not enlarge upon. Pigmentation in this connexion he regarded as important, as patients who pigmented frequently did well in other respects. Light therapy was an intriguing form of treatment because of the unexpectedness of some of its results.

On Saturday, July 4th, the members of the Section of Actinotherapy paid a visit to Lord Mayor Treloar's Cripples' Hospital, at Alton, Hants.

X RAY DIAGNOSIS.

Dr. A. E. Barclay (Manchester) characterised *palpation* under the X ray screen as a complex art, requiring much patient practice, as it depended on a combination of touch and sight. The most important palpation of the stomach was that carried out while the first portions of food were entering it, as it would often reveal a filling defect. Radiographic plates were also necessary, however.

The Radiology of Bones.

Dr. A. Howard Pirie (Montreal) read a paper on *Normal Rarities of Bone Simulating Disease*. He showed on the screen an interesting series of cases, demonstrating ununited patella, simulating fracture, double sesamoid bones in the gastrocnemius, pseudo vesicles on each side of the knee-joint. He had met with five cases of rectus sesamoid, just about the acetabulum, which might be present on one side only. This condition, he considered, must be looked on as a normal abnormality, and appeared to have escaped the notice of anatomists. A separate epiphysis may remain on the second metacarpal bone; this, he held, was a reversion to type, as it was seen in the seal.

Dr. W. H. Stewart (New York) spoke on the time factor in the disappearance of roentgenographic evidence of *Fracture of the Skull*. He said experience had taught us that it was a mistake to be definite about the time required for union of the bones of the skull. In children simple fractures might heal in from six to eight months; in adults the fracture line remained for fully three years. Shelving fractures disappeared more rapidly. Fractures of the occipital bone could be recognised three to five years after the accident. The X ray evidence of comminuted or depressed fractures was usually permanent. He emphasised the medico-legal importance of the time factor.

Dr. A. W. George (Boston) described a method of diagnosing injuries of the atlas and axis by taking an X ray picture antero-posteriorly through the mouth and in the lateral position. Three parallel lines were then drawn passing through bony landmarks on the atlas, axis, and third cervical vertebra, and any divergence of these lines indicated pathological conditions. If, in the antero-posterior position, the patient lying on the table, the space between the atlas and axis were obliterated, that indicated disease of the retropharyngeal structures.

Dr. H. A. Harris (London) gave a demonstration on the screen of the developing centres of ossification of the foetus from the age of 28 days onwards. He said that out of 100 cases of stillborn infants submitted to an anatomy department there was cervical rib present in 35 (in normal adults the percentage is 0.25).

If cervical rib is present in an adult it has not been acquired, but it means it has not been absorbed. The absorption of the cervical rib is the normal process of development.

Sir Frank Colyer (London) described various pathological conditions of the teeth and jaws. Where the pulp of a tooth died, the periodontal membrane might become infected and a granuloma might form. If this granuloma were surrounded by a layer of dense bone, he did not believe that such a tooth gave rise to systemic infection, but where the dense layer was absent, infection did take place. The presence of this dense layer could be determined radiologically, and the speaker urged that it was in questions such as these that the radiologist could be of the greatest help to the dentist.

X Rays and Pregnancy.

Dr. Carlos Heuser (Buenos Aires) demonstrated on the screen a method of injections of lipiodol into the cavity of the uterus for the diagnosis of early pregnancy, fibroids, and non-patency of the Fallopian tubes. By this method it was possible to determine the existence of pregnancy in the first or second month. Injections had been given in 48 cases, and in none had abortion occurred.

Dr. Lars Edling (Lund, Sweden) said that with the X rays he was able in about 200 cases to diagnose pregnancy at the end of the third month or the beginning of the fourth, but not earlier. He had never used lipiodol.

Prof. De Nobele (Ghent) read a paper on the action of Röntgen rays on the evolution of pregnancy and the development of the fetus. His conclusions were that the erythema X ray dose had an indisputable effect on the evolution of pregnancy in the guinea-pig and the rat; in the majority of cases the embryo died, and the earlier the rays were applied the more certain was that result. If the embryo was not actually killed, it developed into a monster. He found also that irradiation in the guinea-pig produced a tendency to formation of ovarian cysts.

Dr. E. H. P. Cave (Harrow) described his method of examining radiologically the male urethra and the bladder, using lipiodol.

Cholecystography.

Dr. R. D. Carman (Mayo Clinic, Rochester, Minn.) and Dr. Sherwood Moore (St. Louis) each read a paper on the development of this branch of diagnostic radiology, and described Graham's method of the use of sodium-tetrabromophenolphthalein and sodium-tetraiodophenolphthalein. Dr. Carman's paper appears at some length elsewhere in this issue. Dr. Moore said that what was now wanted was more information about the physiology of the gall-bladder, and this was being rapidly worked out.

Dr. G. T. Haenisch (Hamburg) recommended the direct duodenal method, by means of a sound, of giving the dye for diagnostic purposes. In this way unpleasant symptoms were avoided.

Dr. Stewart (New York) said he preferred to put the tube into the jejunum, as thus there was no vomiting.

Dr. R. E. Roberts (Liverpool) said that he used the bromine salts intravenously, and no accidents had occurred when attention was concentrated on slow injection.

Dr. J. T. Case (Battle Creek, Michigan) said that the dye showed up inflammatory processes outside the gall-bladder. At Battle Creek tetra-iodol was used intravenously as a routine method in cases where the dye, given orally, did not enter the gall-bladder.

Dr. Moore, in replying, said that oral administration of the dye should be the routine method, and when the diagnostic result was doubtful the intravenous method should then be adopted.

Studies on the Alimentary Tract.

Dr. De Backer (Ghent) read a paper on the alimentary canal in the normal infant. In the discussion which followed, Dr. L. T. Le Wald (New York) said that any case of vomiting in a baby should be examined by X rays for the existence of

hypertrophic pyloric stenosis. He considered that the colon in children needed more elucidation. It was held by some that the pelvic colon was unusually long in the first few years of life, and that this was subsequently outgrown; in the speaker's opinion, however, a long colon, if present in infancy, persisted throughout life.—Prof. Gosta Forssell (Stockholm) said that a contraction of the pyloric end of the stomach was often mistaken for contraction of the pylorus. Hypertrophic pylorus might also be present.

Prof. Forssell read a paper on some further observations on the *Motor Mechanism of the Mucous Membrane of the Digestive Tract*. By means of many excellent radiograms and photographs of fistulae of the small intestine in man, he showed that the folds of the mucous membrane did not depend passively on contractions of the muscular wall of the gut. Other forces came into play, and attention was drawn to the muscularis mucosa. Already in 1913 Prof. Forssell had said that the muscularis mucosa was the independent factor in producing movements of the mucous membrane of the alimentary canal, and this contention had since been more fully demonstrated. The most convincing proof had been from histological studies, when it was shown by a number of observers that the overlapping of muscular cells in the muscularis mucosa occurred in the folds of the mucous membrane this was most distinct in the stomach cavity.

Dr. A. Frankel (Berlin) gave a demonstration of a new symptom of *gastric ulcer*—which he called the cross-bar symptom—within the folds of the membrane by means of Röntgen therapy, and Dr. N. Ratkoczy (Budapest) showed on the screen several cases of duodenal ulcer and adhesions of the duodenum.

Dr. H. H. Berg (Frankfort-on-Main) read a paper on the direct signs of duodenal ulcer, and showed on the screen the effects of various drugs on the motility of the gall-bladder, illustrated by the case of a patient who had a large number of gall-stones in the bladder.

In speaking of intermittent obstruction of the small intestines, Dr. H. M. Imboden (New York) said that if the duodenum were filled and could not empty itself, a hand pressed on the abdomen while the patient took a deep breath would bring about emptying.

Dr. M. I. Lifshitz (Karkow) presented Dr. Lemberg's paper on the roentgenological diagnosis of *chronic appendicitis* based on a study of 105 cases at the Ukrainian Radiological Institute, Karkow.

Dr. R. Feissly (Lausanne) discussed the diagnosis of *ileocecal tuberculosis* in relation to operation findings.

Dr. J. T. Case (Battle Creek, U.S.A.) showed skiagrams of 70 cases of *diverticula of the small intestine*. When diverticula were multiple, the larger ones were nearer the stomach, the smaller ones more remote from it. X rays had enabled him to distinguish false diverticula from true. Three out of four of the 70 patients had no symptoms referable to the diverticula.

Dr. Jacques Forestier (Aix-les-Bains) read a paper on radiodiagnosis by means of lipiodol of *tumours and other causes of compression in the spinal cord*. He emphasised two points (1) that the radiograph must not be taken in the lying position, and (2) that lipiodol must not be injected earlier than the tenth day after the first lumbar puncture had been performed. He also described the injection of the seminal vesicles with lipiodol.

Two most interesting items of the programme were the cinematographic films exhibited by Dr. Lewis Gregory Cole (New York), the one illustrating most graphically the mechanism of the stomach, and the other the spread of tuberculosis in the lungs.

During the Congress an exhibition of radiological studies was on view at the house of the British Institute of Radiology, 32, Welbeck-street, and in the basement of the Central Hall, Westminster, the following firms had assembled a remarkably fine collection of radiological apparatus and matter relating to that specialty:—

Acme International X-Ray Co., Chicago; Aimer, G. C., London; Andrews, Cuthbert, London; Dean, A. E. and

Co., London; Denver Chemical Manufacturing Co., London; GaiFFE Gallot et Pilon, Paris; General Radiological and Surgical Apparatus Co., Ltd., London; Hanovia Quartz Lamp Co., Ltd., British, Slough; Holborn Surgical Instrument Co., Ltd., London; Kahlbaum Chemische Fabrik, Berlin; Kodak Limited, London; Muller, Hamburg; Newton and Wright, Ltd., London; Patterson Screen Company, U.S.A.; Philips Lamps Ltd., London; Radiguet and Massiot, Paris; Radium Belge, Brussels; Rothband, W. S. and Co., Manchester; "Sanitas," Electricitäts-gesellschaft, Berlin; Schall and Son, Ltd., London; Seeman, Dr. H., Freiburg i. Br.; Solus Electrical Co., London; Victor X-Ray Corporation, U.S.A.; Watson and Sons, Ltd., London; X-Rays Limited, London; Zimmerman and Co. (Chemical), London; Zimmerman and Co. (Photographic), London.

LECTURES.

Two formal lectures were delivered during the Congress, the first being the Silvanus Thompson Memorial Lecture, given on the evening of Wednesday, July 1st, by the Duc de Broglie, of Paris. He took as his subject the absorption of x and y radiations and the secondary radiations which accompany them. On Friday, July 3rd, Sir Berkeley Moynihan, of Leeds, as Mackenzie Davidson Memorial Lecturer, spoke on the relationship of radiology and surgery. He said that the radiologist had now given certainty to the surgeon's diagnosis—in kidney and gastric diseases errors of diagnosis had proved extremely lamentable until radiology put things right. No words could be too strong, he added, to denounce the action of the surgeon who operated on a stomach case merely because someone—not the radiologist—had made a diagnosis of gastric ulcer which an inspection of the stomach did not confirm. If a case were wrongly diagnosed and medical treatment alone given, then little harm was done—physicians and surgeons might both be at fault, but the fault of the surgeon was far graver. Why could they not arrange, he asked, that no diagnosis of gastric ulcer should be the warrant for medical or surgical treatment until that diagnosis was made by the radiologist or by the surgeon on the operating table? Radiology had also helped to explain why so many diseases mimicked the condition of gastric ulcer. By clinical means, he said, it was not possible to detect gastric carcinoma in the curable stage of the disease, but, given time, the radiologist could diagnose the condition at that stage. The gifts of radiology to medicine and surgery, he concluded, were things for which humanity at large could be profoundly thankful.

SOCIAL FUNCTIONS.

The Congress dinner was held in the Hotel Great Central, N.W., on July 2nd, the President, Dr. Thurstan Holland, in the chair. The company numbered over 400, many lady guests of members being present. The President, in expressing his gratification that the Congress was to be the first International Congress of Radiology, paid a tribute to the work of two pioneers who had recently died, Sir Archibald Reid and Prof. F. Bérgonié, of Bordeaux. The driving force behind this Congress, he said, had been Dr. Robert Knox, chairman of the organising committee, ably assisted in the entertainment of the lady visitors by Mrs. Knox and the ladies' committee. The delegates of the various countries represented then spoke in succession, the order of precedence being alphabetical. There spoke for the Argentine, Dr. C. Heuser; Austria, Prof. A. Schuller; Belgium, Prof. De Nobele; Canada, Dr. Howard Pirie; Denmark, Dr. C. O. Sonne; France, Dr. A. Bécère; Germany, Prof. A. Dietlin; Holland, Dr. Heilbron; Hungary, Dr. N. Ratkoczi; Irish Free State, Mr. M. R. J. Hayes; Italy, Prof. M. Ponzio; Norway, Dr. S. A. Heyerdahl; Poland, Count Debecki; Russia, Prof. M. Nemenow; Czecho-Slovakia, Dr. W. Altschul; Sweden, Prof. G. Forssell; Switzerland, Dr. R. Feissly; and the United States of America, Dr. P. M. Hickey. The dinner was marked by pleasant cordiality, both international and individual, and concluded with a dance.

The League of Nations Union entertained the delegates to luncheon at the Hotel Cecil, Strand, on

Friday, July 3rd, Lord Cecil of Chelwood in the chair. He said that the science of radiology owed much to international thought and action, and as the conference in London was an example of internationalism in science, the League of Nations Union was delighted to extend to the delegates the warmest welcome. Dr. John Muir, assistant secretary of the Congress, replied.

On Saturday afternoon, July 4th, at the conclusion of the Congress, a garden party was held at Imber Grove, Esher, by invitation of Dr. E. R. Morton, the chairman of the hospitality committee.

THE INTERNATIONAL COMMITTEE

At the final meeting of the delegates on July 4th an international committee was formally constituted, with Prof. Gorsta Forssell of Stockholm, Sweden, as chairman; Dr. C. Thurstan Holland, of Liverpool, as vice-chairman; and Dr. Stanley Melville, 9, Chandos-street, London, W. 1, as secretary. It was decided to hold the next international conference at Stockholm in 1928.

Correspondence.

"Audi alteram partem."

DISABLEMENT FROM CHRONIC RHEUMATISM:

THE NEED FOR A CONCERTED EFFORT.

To the Editor of THE LANCET.

SIR,—Official returns in two countries¹ have recently set forth the prevalence of disablement from rheumatic diseases. In Sweden, as no doubt elsewhere, *senility* and *cardiovascular degeneration* account for more than half the cases of permanent pensionable invalidity. Apart from these "incurable" causes, *articular rheumatism* comes first among the list of disabling maladies, accounting for 9.1 per cent. of the Swedish cases, as against 5.8 per cent. accounted for by pulmonary tuberculosis. The British Ministry of Health, in their classification of "rheumatic diseases," include almost equal numbers of articular and non-articular cases, such as lumbago. Adopting this wider use of the term, rheumatism causes (as we now know) nearly one-sixth of the total industrial disability in England, with an estimated expenditure of £2,000,000 for sick benefit and a loss of 3,000,000 weeks of work per annum. If non-articular cases were included in Sweden, the proportion would probably be much the same (one-fifth to one-sixth of the grand total).

Dr. Kahlmeter makes it clear that rheumatism and tuberculosis are by far the most important causes of disablement (from disease), and that rheumatism imposes a heavier economic burden than appears from the statistics, because the invalidity caused thereby is of long duration, entailing not only a great deal of mental and physical suffering, but a heavy expense to the community. He also points out that the other main disabling diseases are relatively well cared for, but that rheumatism receives little assistance. In Holland and Germany also, we understand that the disablement of workers from this cause is an equally serious problem. Dr. Kahlmeter may well ask whether the State cannot do something to mitigate the disability of such large numbers of workers.

It has been pointed out in the report of the Ministry of Health that treatment of chronic rheumatism is entering upon a more hopeful phase. It is all to the

¹ The Incidence of Rheumatic Diseases. Ministry of Health Reports, No. 23. London, 1924. Examen statistique des causes d'invalidité, fait d'après les demandes adressées à la "Direction des Pensions de Retraite" pendant l'année 1918, sur lesquelles les pensions supplémentaires furent accordées. Par G. Kahlmeter, Docteur en médecine, Médecin consultant de la "Direction des Pensions de Retraite," Stockholm. Acta Medica Scandinavica, vol. lxx., Fasc. i.-vi.

good that the dangers of chronic focal sepsis are now better recognised and provided against, but in our opinion this is only half the battle. In all likelihood there are aetiological factors apart from sepsis, as is evidenced in osteomalacia, which is probably a deficiency disease, by changes in the spine indistinguishable from spondylitis deformans. Chill, traumatism, tubercle, and endocrine disturbance are other probable factors in causation. The investigation of possible metabolic abnormalities is urgently required, and should be one of the chief functions of any clinic established to deal with chronic rheumatic diseases. At the same time the effects of physical remedies—heat and cold, radiant and electrical energy and movement, and the internal use of waters—should be studied and their efficacy compared. In the present state of our knowledge we can but advocate measures directed to improve the general health, to prevent the development of rheumatic tendencies, to increase the resistance of the body to infection, and to promote the absorption of exudations and deposits.

A Committee on Rheumatism has now been appointed by the International Society of Medical Hydrology. It will take these official reports as the basis of its inquiries, which will have for their object some concerted action in the campaign against rheumatic disability in the countries most affected thereby. Practitioners at the health resorts with experience in the treatment of rheumatic diseases, who are disposed to assist the work of the Committee, are requested to communicate with Dr. Ray at 6, Bentinck-street, W. 1.

May we quote two examples of the treatment of chronic rheumatism, carried on for a long period of years, in order to indicate what might be done, with an ampler organisation and equipment?

(1) A charity was founded at Buxton more than 300 years ago for the treatment of the poor suffering from rheumatic disorders. It is unnecessary to quote the figures, but the Devonshire Hospital now accommodates large numbers of industrial workers, recommended by the approved societies, from all parts of the country, many of the more serious cases returning from year to year. It may be added that many observers have recorded strong reactions in rheumatic patients submitted to the Buxton waters. We have here, for many generations, a customary treatment of chronic rheumatism, presenting now a large field for the differentiation of cases and for the scientific use of certain physical methods.

(2) In Holland, where there are no spas, a clinic for physical treatment was opened at Amsterdam in 1905. Since that date about 10,000 rheumatic cases have been treated by baths, manipulation, and electricity. Articular and non-articular cases were in about equal numbers, with many mixed cases. One of us (J. v. B.) has had under his own care during the last 15 years nearly 5000 cases of chronic arthritis, many of which, after temporary improvement, return year by year. The following conclusions are drawn from the work of this clinic: (a) A sedentary life in cold, damp localities plays a great rôle in the development of chronic rheumatic affections. (b) Persons of an arthritic tendency are numerous in Holland, especially among the intellectual classes. When they are exposed to unfavourable external conditions or to accidental toxic invasion, rheumatic developments occur. (c) In these cases the connective tissues become a place of lowered resistance, favourable to inflammatory changes, to parasitic growth, and to atrophy. (d) The influence of mental depression, tuberculosis, and dental sepsis is unquestionable, and that of auto-toxaemia from the bowel probable. (e) Expert treatment at a suitable clinic may, even in unfavourable and progressive cases, maintain the function of the joints, so that invalidity is prevented, whilst treatment by drugs alone is insufficient for this purpose.

We are glad to note that the British Report emphasises the need for further development in the treatment of rheumatism at the spas and elsewhere. Certain natural waters and baths are of proved efficacy in chronic rheumatism, and, with selected methods of accessory treatment, in our opinion, ought to be made available under proper conditions for the greatest possible number of industrial cases. But the spas can only handle a fraction of the needful cases. Is it not possible to provide clinics for rheumatism in the towns? War-time experience with

other forms of disability has shown the great value of clinics, where large numbers of cases can be investigated and treated.

We are, Sir, yours faithfully,

J. VAN BREEMEN.
R. FORTESCUE FOX.
L. J. LLEWELLYN.
E. P. POULTON.
M. B. RAY.

International Society of Medical Hydrology,
36, Devonshire-place, W. 1, July 1st, 1925.

OUTBREAK OF GONORRHOEA IN A CHILDREN'S HOME.

To the Editor of THE LANCET.

SIR,—On Jan. 26th, 1924, 17 girls between 6 and 10 years old, living in an exceptionally well-administered home, were notified as suffering from gonorrhoeal vulvo-vaginitis, confirmed by bacterial examination. Careful inquiry as to the only two admissions in January revealed the fact that one of them (aged 11), admitted on the 11th, was found on the 25th to be suffering from a profuse gonorrhoeal discharge. During her mother's absence in service she had been "running wild" and "had intimate relations with men and received money from them."

The home possessed a sufficiency of small slipper-baths, each child had her own towel, and one or more attendants were present during bathing. But as the number of children was large, the possibility of bathing in common could not be excluded, and I formed the definite opinion that the infection was thus spread. Efficient steps were at once taken to prevent further infection, and the management of the outbreak was entrusted to Dr. H. Gluckman, director of the Municipal Venereal Diseases Clinic, whose treatment was on the following lines:—

Bed for ten days; hot sitz-bath twice daily with 3i. pot. permang. solution (4 per cent.) to each gallon water; then swabbing external genitals with AgNO₃ sol. (gr. v. to oz.), followed by hot vaginal douche with pot. permang. sol. (1 in 5000). As improvement resulted, bathing and douching gradually reduced to bi-weekly or weekly douche only. In the more resistant cases, small doses of detoxicated gonorrhoeal vaccine were given every fifth day, commencing with 3 minims and gradually working up to 10 minims. In a few cases, complicated by secondary infection, a solution of oxycyanide of mercury (1 in 4000) was used now and again as a vaginal douche instead of the pot. permang.

The effects of treatment were gauged by bacterial examination of vaginal smears. In most cases it was possible to cease treatment in about ten weeks; in a few there was a short temporary relapse. By the end of nine months all were giving a negative result. This has persisted since then, in spite of provocative measures—e.g., silver nitrate instillations, injections of vaccine, and strenuous exercise.

It will thus be seen that most of the sufferers responded readily to treatment, but the eradication of gonorrhoeal infection (especially in an institution) is a tedious matter, and nine months passed before a consistent succession of negative bacterial reports justified a clean bill of health.

I believe such an outbreak to be unique in public health records, and its lessons seem to be two-fold: 1. The careful examination in this respect of all new admissions. 2. That baths in barracks, boarding schools, and institutions should be mainly of the hot and cold shower type (both for individual safety and for water-waste prevention) with only such provision of "slipper" or "parallel" baths as may be necessary for medical and surgical reasons.

I am, Sir, yours faithfully,
CHARLES PORTER, M.D. R.U.I., D.P.H. Camb.,
Hon. LL.D. (Witwrd. Univ.), M.O.H. and Lecturer
on Public Health, Johannesburg.

* * * The outbreak reported by Dr. Porter if not unique is sufficiently startling to require comment. The measures of prevention he suggests are sound and reasonable. Many little girls are carriers of

gonorrhœa as a result of infection by towels, w.c.'s, and lavatories, and the youth of a child by no means precludes the possibility of her having gonorrhœa, though such sexual precocity as was found in Dr. Porter's case is rare. No towels, baths, or bedroom chambers should ever be shared by girl children in institutions. This should be a rule admitting of no exceptions. A similar outbreak observed this year at a convent home for older girls in a home county was traced to infection from one or more imperfectly cured cases of gonorrhœa by towels and baths. Facilities in this case were admittedly insufficient, as the institution, though well run in many ways, was short of funds.—ED. L.

THE HOSPITALISATION OF SEVERE TRAUMA ON THE SPOT.

To the Editor of THE LANCET.

SIR,—During the last few days the daily journals have described many a case in which an injured person, after an accident, has died on the way to hospital, or soon after admission. For long it has been my contention that movement, even for a short distance, is the worst possible treatment after any injury; shock is made greater; there is grave risk of injuring soft and vital parts; there is likelihood of re-starting loss of blood; there is serious danger of embolism; there are many possibilities of causing and increasing deformities.

An illustrative episode may serve to bring this home to those who have been schooled in the present regime. Last year I saw a severe injury—compound comminuted fracture of two limbs—nine days after the injury. During these days there had been a minimum of movement, the parts being left undisturbed; and at the end of that time the patient travelled a distance of about a mile from the scene of the injury, and came under my care at a cottage in the country. To my surprise I was able daily to manipulate the fragments into position without causing pain, and to get an ideal result. Not only so, but as the injury of one limb was adjoining the site of an old traumatic deformity, I was able to rectify that at the same time. The cost was trivial, and I did the nursing myself.

This incident confirmed my former conclusion of the wisdom of the advice: *Put a case of trauma into the nearest available bed.* The occupant of the house is not English—I had almost written British—if admission is refused. Some may argue that there is an absence of technical nursing in a rural house. But he is a poor over-schooled doctor who cannot quickly instruct a sister, or a neighbour, to nurse and manage everything well. The finest result that I ever saw after complete transverse fracture of the patella happened where a mother, unschooled but educable, tended her son in his home.

It may be urged that transport facilities are now such that there is no danger. That is just the sad fallacy of it all. Let a well person travel a distance of five miles in the most elaborately equipped ambulance, assuming the posture and position of a badly-injured patient, and he will quickly change his mental attitude towards the treatment of severe traumatism.

I am, Sir, yours faithfully,

R. CUNNINGHAM AFFLECK.

Edinburgh, June 30th, 1925.

A BELGIAN MEDICAL CRUISE.

To the Editor of THE LANCET.

SIR,—After all the causes for gratitude that the Belgian doctors, since the war, owe to the British doctors, the "Medical Days of Brussels," at which your Government was officially represented, have again drawn closer together the bonds which unite our two medical bodies. In these conditions, desirous of giving a tangible proof of our friendship, we have decided to invite our British colleagues to take part in a medical cruise to the Near East which we are

organising. I shall be grateful if you will kindly insert the enclosed notice. Application may be made to me.—I am, Sir, yours faithfully,

Dr. R. BERNARD,

Secrétaire de la Rédaction, Bruxelles-Médical, 117, rue du Trône, Brussels.

July 1st, 1925.

Medical Cruise to the Near East: Itinerary.

Marseilles, Alexandria, Cairo, Port Said, Jaffa (Jerusalem), Beyrouth (Damascus-Liban), Smyrna, Constantinople, Le Pirée (Athens), Malta, Naples, Marseilles. Departure August 24th; return, Sept. 18th. Special conditions; 2700 French francs each for doctor and wife, 3600 French francs for each member of a doctor's family. The voyage is first-class by the large and luxurious packets *Cordillère* and *Lotus* Oriental mails. There will be an opportunity of visiting Cairo, Jerusalem, Damascus, and Athens, and of prolonging by 12 days the stay at Beyrouth in order to visit thoroughly Syria and Palestine. It will also be possible to visit Baghdad, three days by motor-car from Beyrouth.

A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—My attention has been called to a report in the *Daily News* of my annual hospital tea party. Although I was aware that the occasion was to be used for giving publicity to the hospital building fund, I had no knowledge that personal allusions were to be made to myself. I much regret that in the report references were made for which I am in no way responsible, and which are both undesirable and unnecessary. I am, Sir, yours faithfully,

London, W., July 4th, 1925.

H. J. PATERSON.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Spahlinger Treatment.

THE Parliamentary Medical Committee met on July 2nd, to consider a report from five of its members who recently visited the establishment of Mr. Spahlinger at Geneva. The report commented favourably on the visit, and suggested that an effort should be made to raise £100,000 in this country by means of a public campaign to enable Mr. Spahlinger to continue his work. The Committee passed the following resolution:—

"That the Parliamentary Medical Committee has received with much interest the account of the visit to the Spahlinger establishment which the five members of the Committee have drawn up, not as a delegation from the Committee, but as private individuals. The Committee are of opinion that a *prima facie* case has been made out for further investigation, but the Committee resolve that they cannot as a corporate body take any action in the matter."

HOUSE OF COMMONS.

WEDNESDAY, JULY 1ST.

Night-work in Bakeries.

Colonel WOODCOCK asked the Minister of Labour whether His Majesty's Government proposed to take any step to refer to the Permanent Court of International Justice the question whether the draft convention in regard to night-work in bakeries proposed by the recent International Labour Conference, which related to an industry which was not the subject of international industrial competition and which prohibited night-work by master bakers as well as by persons employed, was consistent with the purpose of Part XIII. of the Versailles Treaty of Peace, and also the question of the competence of the conference to pass such a draft convention.—Sir A. STEEL-MAITLAND replied: This convention, as finally presented to the recent International Labour Conference, was not acceptable to His Majesty's Government, and their representatives voted against it. It is not the intention of the Government to take any further steps with regard to the convention in the direction indicated.

Persons Excluded from Pensions Bill.

Mr. TREVELYAN THOMSON asked the Minister of Health the approximate number of persons who, on account of their not being insured under the National Health Insurance Acts, would be excluded from all benefits under the proposed Pensions Bill, and the proportion which would be wage-earners.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: So far as the first part

of this question is concerned, I would refer the hon. Member to Tables F and G on pp. 41 and 42 of the Government Actuary's Report on the Bill. These tables show in some detail the total population of each sex and the corresponding insured population. In regard to the second part of the question, the compulsory provisions of the Bill apply to practically all wage-earners who are either engaged in manual labour or are employed at rates of remuneration not exceeding £250 a year, and provision is being made for the continuance, on a voluntary basis, of the insurance of wage-earners who cease, or have already ceased, to be included in these categories.

The Use of Artificial Light.

Mr. KENYON asked the Minister of Health whether, before sanctioning the setting up of institutions for the use of artificial light by local authorities, he would satisfy himself that a doctor experienced in this work was available.—Sir KINGSLEY WOOD replied: The answer is in the affirmative.

THURSDAY, JULY 2ND.

Water Shortage at Saltash Hospital.

Colonel DAY asked the Minister of Pensions whether, seeing that there was a shortage of water at the Ministry of Pensions Hospital for neurasthenics at Saltash, and that 450 patients and a large staff had not the necessary supplies, he would allow the patients to return home and continue to draw full treatment allowances.—Major G. C. TRYON replied: The temporary shortage of water which prevailed for a few days at Saltash Hospital has now disappeared. The supply for the last fortnight has been normal and is adequate for all requirements. I do not anticipate any further difficulty.

Closing of Oulton Hall Hospital.

Mr. LUNN asked the Minister of Pensions whether it had been decided to close the hospital at Oulton Hall, near Leeds; if so, on what date he proposed to close it and for what reason; was he aware that Oulton Hall was the only neurasthenic hospital in the county of York; that the hall and grounds had been given free to the nation by the owner to be used for this purpose; that there were 120 patients there, and a large number of ex-Service men who had received considerable benefit from treatment at this establishment; and that there was no other way in which they could be treated so economically; and would he reconsider his decision so as to allow the good work to proceed uninterrupted.—Major G. C. TRYON replied: In view of the continuous decline in the number of pensioners requiring the kind of treatment provided at Oulton Hall it has been decided, after a careful review of the position throughout the country, to close this hospital (where there are at present 84 patients, only 42 of whom are drawn from the county of York) at or about the end of this month. In arriving at this decision, the points mentioned by the hon. Member have not been overlooked, but I have had to keep in view the general requirements and the necessity for making the most efficient and advantageous use of the facilities for neurological treatment at my disposal, having regard to the reduced number of cases to be dealt with and their distribution over the country as a whole.

Night-work in Bakeries.

Mr. TREVELYAN asked the Home Secretary what the figures were of the final vote in favour of the ratification of the convention for the abolition of night baking at the International Labour Conference; how many of the votes adverse to ratification represented governments and which governments; how many represented the employers; and how many the workers.—Sir W. JOYNSON-HICKS replied: The figures at the final vote showed 81 in favour of the draft convention and 26 against. Of the adverse votes, three were given by delegates representing the British and Indian Governments, and the remainder by employers' delegates. There were a considerable number of abstentions.

Medical Inspection of School-children.

Mr. BRIANT asked the President of the Board of Education whether the Board had taken any steps to enforce the provision of medical inspection for the detection and correction of visual defects in those schools under the 14 local education authorities which the chief medical officer of health, in his report of 1923, stated make no such provision.—Lord E. PERCY replied: I am glad to say that of the 14 local authorities in question six have, since the report was issued, provided for visual treatment, and seven others have submitted proposals for such provision. In the remaining case I am advised that any treatment which may be required can be obtained without special provision being made by the authority.

Compensation for Mr. W. S. Harnett.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Health whether he would advise the Government to pay to

Mr. William Smart Harnett an adequate sum in compensation for his wrongful detention in various mental hospitals, having regard to the fact that Mr. Harnett had been found by a jury to have been sane when detained by Dr. Bond and for the rest of his detention, that this opinion had not been upset by either the Court of Appeal or the House of Lords, by which tribunals Mr. Harnett's case had been heard, and having regard to the fact that, although having thus been found to be sane, Mr. Harnett was to-day practically a ruined man on account of the legal expenses of the three actions in which he was concerned and the heavy expenses of his confinement, in all a sum of over £25,000.—Mr. NEVILLE CHAMBERLAIN replied: I do not think that any claim for compensation out of public funds can be substantiated in this case. In any event, no servant of the Crown was involved other than Dr. Bond, and, as my noble friend is no doubt aware, a new trial has been ordered against Dr. Bond, and the matter is therefore still sub judice. I must not, however, be taken as admitting that the question accurately states the facts, for I observe that the Lord Chancellor in his judgment dismissing Mr. Harnett's appeal expressly pointed out that it was not in fact proved at the trial, nor found by the jury, that the appellant was of sound mind between the date of his alleged detention by Dr. Bond and his subsequent escape from custody.

Ophthalmic Benefit.

Mr. BENNETT asked the Minister of Health whether he was aware that, as a result of the new model scheme for the provision of ophthalmic benefit by approved societies, which stipulated that an applicant for the benefit must, at the cost of 1s., have obtained and furnished his society with a written recommendation from a panel doctor, the charge for the necessary ophthalmic examination of the applicant had increased from 5s., which was the fee paid to qualified opticians, to £1 1s., which was the fee charged by ophthalmic surgeons; and whether, in view of the satisfactory nature of the service heretofore rendered by qualified opticians, he would suspend the order until the Royal Commission on the disposal of the surplus funds of the various approved societies could investigate and report on the matter.—Mr. NEVILLE CHAMBERLAIN replied: I am aware that the cost of ophthalmic benefit under the new scheme may, in certain cases, show an increase as stated by the hon. Member over the cost of optical benefit under the existing schemes, but there will be no charge for the insurance doctor's recommendation, and the new arrangements have been generally accepted by approved societies. It is impracticable to adopt the suggestion in the latter part of the question, inasmuch as the new schemes for societies and branches, valued as at Dec. 31st, 1922, are due to commence on Monday next.

High Infant Mortality at Market Drayton.

Mr. GRIFFITH asked the Minister of Health whether he had seen a report of a recent meeting of the Market Drayton Nursing and the Maternity and Infant Welfare Associations, where Dr. Wheatley, the medical officer for Shropshire, alluded to the high infant mortality of Market Drayton, and said that the principal causes of the high rate of infant mortality were bad housing and ignorance; and that the remedies were education and better housing; and whether he would at once publish the report of his own medical woman inspector on Market Drayton, to show what was her view of the causes of, and remedies for, the high infant mortality.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, I would refer the hon. Member to the answer which I gave on this subject on May 11th.

Sewage Pollution of the River Lee.

Captain GARRO-JONES asked the Minister of Health whether he was aware that the River Lee, which passed through thickly populated London districts, was at present badly polluted with crude sewage; that the pollution was now worse than it had ever been; that the state of the river was not only offensive to the many rowing clubs which used it but was detrimental to the health of the dense riparian population; that the powers under the Rivers Pollution Prevention Acts were, as respects this river, divided between the Middlesex County Council and the Lee Conservancy Board; and that most of the pollution originated from tributaries within the control of the Middlesex County Council; and whether he would consider the desirability of promoting a short Bill to make the Lee Conservancy Board the rivers pollution prevention authority for the whole length of the river and its tributaries, and immediately urging the urban districts in Middlesex and the Middlesex County Council, in the interests of public health, to cease discharging sewage into the River Lee and its tributaries.—Mr. NEVILLE CHAMBERLAIN replied: I am aware of the unsatisfactory condition of this river. I am not satisfied that it would be desirable to promote a Bill as suggested. The right remedy is to obtain treatment and disposal of the sewage, and my

efforts have been directed to that end. Two of the large local authorities are now spending large sums in improving their disposal works, and a Bill is now before Parliament for taking the sewage of two others into the London main drainage system. When these improvements have been effected, conditions should be very much better.

Birmingham Hospital Bill.

St. Mary's Church, Birmingham, and General Hospital Bill was read a third time.

FRIDAY, JULY 3RD.

Infant Death-rate in Bombay.

Colonel DAY asked the Under Secretary of State for India whether he was aware of the increasing practice in Bombay of women employed in cotton factories administering opium to their babies before proceeding to their work and that, as a result, the infant death-rate in Bombay was approximately two in three; and would he make representations to those concerned suggesting that opium be made less accessible.—Earl WINTERTON replied: I am aware of the practice, but not that it is increasing. The average annual figures of infant mortality from all causes for the three years from 1922 to 1924 was 411 per 1000, as compared with 624 in the previous three years. As regards the last part of the question, the Government of India have addressed inquiries to all local governments as to the extent of the practice referred to and the question of taking measures specially designed to check it; my noble friend proposes to await the results of these inquiries.

MONDAY, JULY 6TH.

Indian Medical Service.

Sir RICHARD LUCE asked the Under Secretary of State for India if the Government had yet arrived at conclusions as to the future of the Indian Medical Service; and whether it was their intention to carry out the proposals of the Lee Commission in this respect, especially in the matter of establishing provincial medical services the members of which would not be under the control of the Secretary of State.—Earl WINTERTON replied: The Government of India's proposals are now under the consideration of my noble friend the Secretary of State, who hopes to arrive at early decisions. Meanwhile I regret that I am unable to make any further statement.

Medical Services in Tanganyika.

Mr. BARCLAY-HARVEY asked the Secretary of State for the Colonies the amount spent on medical and sanitary services and research work by the Germans in Tanganyika in the year 1913; and what were the corresponding figures for the year 1923-24.—Mr. AMERY replied: Owing to the difference in the system on which the British and German estimates are presented, the comparison is by no means easy. The amount provided for the services referred to in the German estimates for 1913 is approximately £99,000, converting the mark at 20 to the £. But this does not include expenditure by certain local bodies to which grants were made for a variety of purposes, including expenses connected with hospitals and sanitation, which are not shown separately in the estimates. The amount provided for similar services in the estimates for 1923-24 was approximately £116,700, which included all expenditure on buildings.

Lieut.-Colonel JAMES asked if the right hon. gentleman was satisfied that the amount spent was sufficient to fight epidemic disease in Tanganyika.

Mr. AMERY: No, Sir; I should like to spend a great deal more.

New Tuberculosis Order.

Mr. ALBERT ALEXANDER asked the Minister of Agriculture whether he would have the draft of the Order he was proposing to make, directing the slaughter of cattle affected with tuberculosis on the lines of the Tuberculosis Order of 1914, placed in the Library of the House before the discussion takes place on the Diseases of Animals Financial Resolution.—Mr. WOOD replied: Yes, Sir; I hope to place a copy of the draft Order in the Library towards the end of the present week.

Food Preservative Regulations.

Sir ROBERT GOWER asked the Minister of Health whether he had received a communication from the Bakery Allied Traders' Association representing that the result of the proposed Public Health (Preservatives, &c., in Food) Regulations, 1925, would mean dearer food and an acute shortage of supplies, with actual starvation in sight should a national emergency arise; and whether he had any statement to make upon the matter.—Sir KINGSLEY WOOD replied: Yes, Sir, my right hon. friend has received the communication referred to, which has had very careful consideration. He cannot, however, admit that there is any substantial ground for the apprehension expressed in the latter part of my hon. friend's question.

Dirty Fruit from Turkey.

Dr. HADEN GUEST asked the Parliamentary Secretary to the Overseas Trade Department whether his attention had been called to the existence of dirty and insanitary conditions prevailing in the transport, handling, and packing of dried fruit at Smyrna, Anatolia, and to the rates of wages and conditions of labour of the workpeople employed; and whether he would make inquiry to determine what action, through the consular service or otherwise, was required to protect the consumer against dirt contamination and the Dominions fruit-grower against unfair competition.—Mr. A. M. SAMUEL replied: This matter has engaged the attention of the Ministry of Health and my department very fully for some considerable time, and I have been in frequent communication on the subject with both the Ministry of Health and H.M.'s Consul General at Smyrna. I will consider in conjunction with my right hon. friend what action it is possible to take after further reports, which I have called for, have been received from Smyrna.

Prohibition of Night Baking in Foreign Countries.

Mr. TREVELYAN asked the Minister of Labour how many European countries had already abolished night baking; and in how many of those countries there had been any resultant rise in the price of bread.—Mr. BETTERTON (Parliamentary Secretary to the Ministry of Labour) replied: The information available shows that legislation prohibiting night work in bakeries is in force in the following European countries: Austria, Belgium, Czecho-Slovakia, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Soviet Russia, Spain, Sweden, Switzerland (two cantons). This legislation does not necessarily follow the lines of the convention recently adopted by the International Labour Conference. I am unable to state from the official records of retail prices which are available how far any rise which may have taken place in the price of bread in the respective countries is attributable to the operation of such legislation.

TUESDAY, JULY 7TH.

Miners' Phthisis.

Mr. DAVID GRENFELL asked the Secretary for Mines whether he was in a position to report upon the inquiries of his department into the incidence of miners' phthisis among men engaged in rock-drilling by the use of compressed air machines.—Colonel LANE-FOX replied: I am not in a position to give any general conclusions, for the inquiry in question was confined to three mines. But its result was to support the apprehension that, in those mines, rock-drilling may be dangerous to health. I have arranged for a more extensive inquiry to be put in hand at once. Meantime the inspectors are taking up the question of precautionary measures at the three mines.

State Contributions to National Insurance.

Mr. RHYS DAVIES asked the Minister of Health if he would give the ratio of State contributions towards the national health and widows', orphans', and old age pensions insurance schemes, respectively, based on each £1 benefit payable or on any other unit of calculation.—Sir KINGSLEY WOOD replied: As the hon. Member is aware the State contribution towards the National Health Insurance system is two-ninths of the expenditure on benefits, exclusive of the cost of central administration; including this item the State contribution is just over one-quarter. It is estimated that the State contribution to the new pensions system will be equal, on the average, to one-quarter of the expenditure on benefits in the first ten years of the scheme and that after this period it will be approximately two-fifths of the expenditure.

Food Preservatives Regulations.

Mr. ALEXANDER asked the Minister of Health when the Public Health (Preservatives, &c., in Food) Regulations were to be laid before Parliament; whether any alterations in the published draft were proposed; and, if so, whether information as to the nature of these alterations could be supplied to Members before the regulations were finally made and laid before Parliament.—Sir KINGSLEY WOOD replied: My right hon. friend hopes that the regulations will be laid before Parliament adjourns. Considerable modifications have been made in the original draft as a result of full discussion between my right hon. friend's officers and the interests involved. The actual coming into force of the regulations will be postponed to enable necessary adjustments to be made by the trades concerned, and during that period my right hon. friend would hope that a discussion might be arranged in this House if there is a general desire for it.

THE TUBERCULOSIS CONFERENCE.

THE eleventh annual conference of the National Association for the Prevention of Tuberculosis, under the chairmanship of Sir Arthur Stanley and Sir Robert Philip, was held this week at the Robert Barnes Hall of the Royal Society of Medicine, when upward of 500 delegates attended. The international character of the gathering was indicated by papers written by scientists from Austria and Denmark. Dr. V. Vorobieff, professor of tuberculosis at Moscow University, brought the good wishes of his Russian colleagues.

The subjects under discussion were Tuberculosis in Childhood and the Treatment of Tuberculosis by Sanocrysin. The conference was opened by Sir Kingsley Wood. It had been intended that Prof. Pirquet should have delivered the introductory address, but being prevented Dr. Richard Wagner, his first assistant at the Vienna Children's Clinic, read his paper. Prof. Pirquet analysed with remarkable clarity the statistics of tuberculosis given in the Registrar-General's annual report for 1922. In his turn Dr. Wagner gave an illuminating account of the mode of treatment employed at the Vienna Clinic, the chief features of which were the complete disregard of tuberculin therapy and the attention paid to the feeding of the tuberculous child. Food-scales had been worked out in relation to the sitting height of the children who were given larger quantities of food than healthy children of the same age. Stress was laid on the desirability of dealing with tuberculous children in their own homes; hospital accommodation could not possibly be provided for all the cases existing. A slide illustrating a practical wooden balcony for open-air therapy, attached to the window of an ordinary house, was shown.

Dr. A. Stanley Griffith, of the Field Laboratories, Cambridge University, emphasised the importance of dealing with the menace of tuberculous cows' milk; he thought that the general public was not sufficiently informed of the fact that bovine tuberculosis was an important source of human tuberculosis. Sir Henry Gauvain stigmatised the argument that drinking slightly infected tuberculous milk would enable children to acquire immunity to infection as a dangerous and unnecessary doctrine; even if it was proved to be correct there would be more scientific methods of imparting such immunity. Medical men would hesitate to eat infected oysters knowingly to immunise themselves against typhoid fever. Prof. J. Fraser, of Edinburgh, pointed out the large proportion of cases of surgical tuberculosis coming from country districts to the Edinburgh Children's Hospital; this he attributed to the ignorance of the cow-keeper of the harm done by tuberculous milk. Sir Percival Hartley expressed his entire agreement with all that had been said on the dangers of tuberculous milk and finally, at the instance of the (medical) chairman of the St. Helens Public Health Committee, a resolution was sent by the conference to the Ministry of Health urging the Government to render effective the provisions of the Milk and Dairies Act dealing with tuberculous milk.

Instructive accounts of the treatment of surgical tuberculosis at Alton and Carshalton were given by Sir Henry Gauvain and Dr. W. T. Gordon Pugh. Slides were shown illustrating the successful treatment of marked kyphosis at Alton by hyperextension. Dr. Pugh showed carriages on which a child could be satisfactorily immobilised during attention to its natural functions and the toilet of the hair. Pushed on these carriages the children were able to go out and see the shops and pay a visit to the cinema. He emphasised the importance of parents allowing their children to be sent to hospital in an early stage of the disease. Prof. Louise McIlroy pointed out the lack of co-ordination existing at present between the obstetrician and the tuberculosis physician; she wanted a sanatorium equipped with an obstetrical staff instituted near the borders of London for pregnant tuberculous women.

The last session was devoted to papers by Profs. Mollgaard and Knud Faber, of Copenhagen, and Prof. S. Lyle Cummins on the sanocrysin treatment. Sir Robert Philip expressed a guarded opinion that the ultimate outlook of this method of treatment is encouraging, and praised the scientific attitude taken up by Prof. Mollgaard, who had placed his knowledge at the disposal of the Medical Research Council. Emphatic opinions were expressed by hospital workers and tuberculosis officers on the folly of allowing advanced cases to take their discharge from institutions and so return home to infect the young children of the family.

Medical News.

UNIVERSITY OF LONDON, KING'S COLLEGE FOR WOMEN.—At the third B.Sc. examination in Household and Social Science held recently the following candidates were successful:—

Edna G. Allen, Margaret F. Brownlee, Zélie G. Bull, Bertha M. Grainger, Grace J. Helps, Hyacinth E. Kirwan, Nancy H. Knowles, Elspeth M. Marshall, Helen E. Ross, Dorothea V. C. Story, Enid C. Strange, Annie Sutcliffe, and Mary M. G. Wright.

UNIVERSITY OF OXFORD.—The following candidates passed in the recent Final Examination for the degrees of B.M. and B.Ch.:—

Materia Medica and Pharmacology.—Howard W. Allen, Merton; Ormond A. Beadle and Denis H. Brinton, New; Conal Charleson, Queen's; Henry E. Cuthbert, St. John's; Johannes G. A. Davel, Trinity; Walter N. Dickenson, Pembroke; Hugh R. J. Donald and Cecil W. Flemming, Trinity; Kenneth A. Hamilton, Christ Church; Reginald A. Haythornthwaite, Keble; Otto Hooper, University; Charles W. Hope-Gill, Queen's; Stanford Howard, Christ Church; George L. M. Inkster, Balliol; Arthur J. Leslie-Spinks, Oriel; George E. Macdonald, New; Robert G. MacGregor, Worcester; Patrick C. Mallam, Queen's; Ripley Oddie, Oriel; Robert Okell, Christ Church; Malcolm G. Pearson, Keble; Jack W. Pugh, University; Hill G. Wells, Magdalen; and Edward M. B. West, New.

Pathology.—Ormond A. Beadle, New; Louis W. H. Bertie, St. John's; Denis H. Brinton, New; Wilbert H. Brown, Queen's; Noel Chilton, Brasenose; John H. Chitty, New; Alan W. Cubitt, Wadham; Eric L. Fothergill, Keble; Alan C. Gairdner, University; Arthur H. Gale, Trinity; Thomas B. Hodgson and Charles W. Hope-Gill, Queen's; Alfred Kendrew, Christ Church; James H. Kennedy, Magdalen; David Lurie, Lincoln; Clifford E. Roberts, Jesus; Richard W. A. Simmons, Oriel; Edward M. B. West, New; Arthur G. Wilson, Brasenose; Rosalind V. Carruthers and Margaret A. L. Herbertson, Society of Oxford Home Students; Margaret N. Jackson, Somerville; Kathleen G. Norton, St. Hugh's; and Irene M. Titcomb, Society of Oxford Home Students.

Forensic Medicine and Public Health.—Douglas A. Abernethy and Eric N. Allott, Balliol; Frank J. Bach, New; Robert B. Bourdillon, University; Hugh N. Bradbrooke and Clarence S. Broadbent, Queen's; Albert V. Clemmey, Christ Church; Charles R. Croft, Trinity; John N. C. Ford, Hertford; Samuel Harris, Jesus; Thomas B. Hodgson, Queen's; Alfred Kendrew, Christ Church; Raymond Lewthwaite, Magdalen; Thomas M. Ling, New; Gerald L. M. McElligott, Hertford; William D. B. Read, Magdalen; Clifford E. Roberts, Jesus; Richard W. A. Simmons, Oriel; John W. de W. G. Thornton, Magdalen; George P. Thorold, Trinity; Oliver R. Tisdall, Hertford; Arthur L. Wilkinson, Trinity; William R. Wood, Pembroke; Hon. Olive B. Buckley, Somerville; Kathleen G. Norton, St. Hugh's; Janet M. Vaughan, Somerville; and Rosa S. Wordsworth, Lady Margaret Hall.

Medicine, Surgery, and Midwifery.—Douglas A. Abernethy and Eric N. Allott, Balliol; Robert B. Bourdillon, University; Hugh N. Bradbrooke, Queen's; John S. Jerome and Alfred Kendrew, Christ Church; Eric L. Newell and Clifford E. Roberts, Jesus; Victor P. Robinson, St. John's; John G. S. Thomas, Hertford; Robert A. Walsh, Magdalen; Evelyn C. Whitehall-Cooke, Queen's; Hon. Olive B. Buckley, Somerville; Ella J. Cockram, Society of Oxford Home Students; and Janet M. Vaughan, Somerville.

The following Theodore Williams Scholarships have been awarded: In Physiology, F. Hawking (University Coll.); in Human Anatomy, J. M. Gibson (University Coll.); in Pathology, O. A. Beadle (New Coll.). The Welsh Memorial Prize for Anatomical Drawing was awarded to J. H. B. Beal (scholar of University Coll.). The Radcliffe Scholarship in Pharmacology was awarded to K. A. Hamilton (Christ Church). Recent elections by external bodies:—To a Commonwealth Fund Fellowship: B. G. Scholefield (Christ Church and Guy's Hospital); to Rockefeller Medical Fellowships: W. S. Dawson (Trinity Coll.), H. W. Florey (Magdalen Coll.), and G. P. Wright (Exeter Coll.).

ROYAL COLLEGE OF SURGEONS OF ENGLAND: ELECTION OF COUNCIL.—The annual meeting of Fellows of the Royal College of Surgeons to elect three members of the Council was held on July 2nd, the President, Sir John Bland-Sutton, Bart., in the chair. There were seven candidates for three vacancies. The President declared the following three Fellows to be elected:—

	Votes.	Plumpers.
Arthur Henry Burgess	462	48
James Sherren	441	14
Sir John Lynn-Thomas	406	7

The other candidates were:—

Victor Bonney	361	19
Vincent Warren Low	332	12
John Percy Lockhart-Mummery	243	11
Herbert John Paterson	232	18

The President further declared that 964 Fellows had voted, 961 sending ballot-papers through the post, and 3 voted in person. Three invalid ballot-papers were received. Mr. H. J. Price (of Maldon) and Mr. Wilmott Evans (of Harley-street) were the scrutineers.

LIVERPOOL'S NEW HOSPITAL FOR WOMEN.—At a well-attended meeting held at Liverpool on June 29th approval was given to the scheme for the amalgamation of the Hospital for Women (Shaw-street) and the Samaritan Hospital, and authority was given for the issue of a public appeal for £80,000, which, with the £40,000 already in hand, will make up the £120,000 estimated for the new building and its equipment. Both of these hospitals have a large record of usefulness, but the present buildings—with 85 beds—are out of date. The new scheme will provide 120 beds. At the meeting promises of subscriptions to the amount of £10,000 were announced, including £5000 from the sons of the late Alderman Cohen, £1000 each from Sir Charles Nall-Cain and Lieut.-Colonel Campbell N. Watson, D.S.O., £600 from Mrs. J. R. Hughes, and £500 each from Sir William Forwood and Sir Richard Caton, £250 each from Messrs. Balfour, Williamson and Co. and Mr. Frank Minoprio, and £200 each from Dr. Gemmell, Mr. Archibald Crawford, and Messrs. Wm. Crawford and Sons, Ltd.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A late afternoon course in the Diagnosis and Treatment of Common Diseases of the Nervous System has been arranged by the West End Hospital from July 27th to August 14th. The lectures and clinical demonstrations will be given in the out-patient department at 73, Welbeck-street. A vacation course will be held at the Prince of Wales's General Hospital (North-East London Post-Graduate College, Tottenham) from August 4th to 15th. The daily sessions from 10.30 A.M. to 5.30 P.M. will include lectures and demonstrations in all branches of Medicine and Surgery and in the Special Subjects, including Mental Diseases and Fevers, the first of which will be by Mr. Lockhart-Mummery. The formal lecture, at 4.30 P.M., will be free to members of the Fellowship of Medicine. From August 24th to Sept. 5th the Queen Mary's Hospital, Stratford, will give an intensive course, when lectures, demonstrations, ward rounds, operations, &c., will be demonstrated in the various departments of medicine, surgery, and the specialties. The following special courses will take place in September: Diseases of the Chest, Infants, Dermatology, Electrotherapy, Ophthalmology, and an intensive course at the Westminster Hospital. Copies of the syllabus of each of the above-mentioned special courses and the programme of the Fellowship of Medicine will be sent on application to the Secretary at 1, Wimpole-street, London, W. 1.

IRISH MEDICAL ASSOCIATION: ANNUAL MEETING.—The annual meeting of this Association was held on June 25th at the Royal College of Surgeons in Ireland, Senator W. O'Sullivan, M.D., President, in the chair. There was only a fair attendance of the 456 members on the books of the Association on Dec. 31st, 1924. Prof. F. C. Purser, of Dublin, and Dr. H. T. Warnock, of Donegal, were unanimously elected President and Vice-President. Prof. Purser, in his presidential address, pointed out that an overwhelming body of medical opinion in Ireland was in favour of the continuance of the present system of medical registration. It was not inconsistent with their national aspirations, because no pressure was put on them to continue as they were, and they could end their coöperation with the General Medical Council at the termination of any agreement come to between the Irish and English Governments. Economically, it was true, they were training many able men and women who could not hope to earn a living in Ireland, but the solution of this did not lie in setting up an Irish Medical Council. These young men and women intended to join the profession anyhow, and if they could not get trained in Ireland they would get trained elsewhere, to the great loss of Dublin, Cork, and Galway.

ROYAL INSTITUTION.—A general meeting of the members of the Royal Institution was held on July 6th, Sir James Crichton-Browne, Treasurer and Vice-President, in the chair. The special thanks of the members were returned to the Delegacy of the City and Guilds (Engineering) College for their valuable gift of micro-photographic apparatus. Mrs. Romanes and Dr. R. A. Young were elected members.

NURSING AND PUBLIC HEALTH.—At the annual meeting of the Manchester and Salford District Nursing Institution held on June 30th Dr. R. Veitch Clark, medical officer of health for Manchester, spoke of the way in which the associations and the public health authorities might be most usefully developed. It was in dealing with diseases of young children—measles, whooping-cough, bronchitis, and bronchial pneumonia—that the practice of curative and that of preventive medicine were closely interlinked. Nursing associations were primarily established for the care of those who could not themselves afford to pay for nursing, and indeed a large part of the work of their association was confined to such cases. Between the very poor and the rich there were two classes, represented by the wage-earners under the National Health Insurance Act and by the group immediately above this class who were not wealthy, but reasonably comfortable. Dr. Clark outlined a scheme whereby the families of the "reasonably comfortable" group could obtain cheap nursing benefits. Employees at private firms would contribute 1d., 2d., or 3d. a week to the Nursing Institution and receive in return any nursing that from time to time they might require. The contributions could be paid weekly or monthly, according to the amount of nursing desired, or a definite charge could be paid for the daily visits of the nurse as required. The scheme, he said, was a practical one; before he came to Manchester he had established one elsewhere on similar lines and it was running successfully.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 13th, to SATURDAY, July 18th.—**QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E.** Special Course in Diseases of Children daily from 10 A.M., morning and afternoon sessions covering demonstrations, ward round, out-patient departments, and operations (second week).—**ST. PETER'S HOSPITAL, Henrietta-street, W.C.** Special Course in Urology. Clinical work every afternoon throughout the week. Lectures: Monday, Mr. J. Swift Joly: Tumours of the Urinary Tract; Tuesday, Mr. Swift Joly: Urinary Calculi; Wednesday, Mr. Clifford Morson: The Relationship of Urology to Group Medicine; Thursday, Mr. F. J. F. Barrington: Non-tuberculous Infections of the Urinary Tract; Friday, Sir John Thomson-Walker: Urinary Obstruction.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 13th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Donald Armour: Operations.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept. 3 P.M., Dr. Pritchard: Medical Wards.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Dowling: Skin Dept.

THURSDAY.—11 A.M., Sir Henry Simson: Gynaecological Wards. 12 noon, Dr. Pritchard: Modern Methods of Medicine. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—10 A.M., Sir Henry Simson: Gynaecological Operations. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

TUESDAY, July 14th.—4.30 P.M., Mr. N. B. Fleming: Fundus Changes as an Index of General Diseases.

FRIDAY.—4.30 P.M., Mr. W. E. Tanner: Surgical Aspects of Tuberculous Mesenteric Glands.

Daily: In- and Out-patient Cliniques, Operations, Cliniques in Special Departments, &c.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Marylebone-road, N.W.

THURSDAY, July 16th.—5 P.M., Mr. Leslie Williams: Toxæmia of Pregnancy.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, July 16th.—4 P.M., Dr. Thursfield: The Treatment of the Asthmatic Child.

Appointments.

FAULKNER, H. A., M.R.C.S., L.R.C.P. Lond., B.V.Sc., has been appointed a Member of the Honorary Medical Staff of the Willesden General Hospital.
 GILMOUR, J., M.S. Durh., F.R.C.S. Eng., Hon. Assistant Surgeon, Royal Victoria Infirmary, Newcastle-on-Tyne.
 Royal Northern Hospital, Holloway: CALVERT, I. E. G. B., M.D., M.R.C.P., Physician with charge of Out-patients; LANE-ROBERTS, I. C. S., F.R.C.S., Obstetric Surgeon with charge of Out-patients.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen County.—Asst. M.O.H. £600.
 Bath, Royal Mineral Water Hospital.—Res. M.O. £130.
 Birkenhead Union Infirmary.—Res. Asst. M.O. £300.
 Birmingham University.—Lecturer in Physiological Dept. £300.
 Also Demonstrator of Anatomy. £300.
 Bournemouth, Royal Victoria and West Hants Hospital.—Res. H.S. £150.
 Cairo, School of Dental Surgery.—Supt. and Lecturer in Metal-lurgy, &c. £E.900. Lecturer in Surg. £E.480. Asst. Lecturer in Surgery. £E.360. Lecturer in Mechanics. £E.480.
 Cardiff City Mental Hospital, Whitechurch.—Res. Clin. Asst. 50 guineas.
 Colombia, South America.—Hosp. Asst. M.O. £600-£650.
 Eastbourne, Royal Eye Hospital.—Hon. Ophth. S.
 Edinburgh University.—Chair of Public Health. £1000.
 Evelina Hospital for Children, Southwark, S.E.—H.S. £120.
 Exeter, Royal Devon and Exeter Hospital.—Reg. and Clin. Asst.
 Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—Radiologist. £100.
 Hertford County Hospital.—H.S. £150.
 Hong Kong University.—Reader in Biology. £600.
 Lanark County.—Bacteriologist and Pathologist. £750.
 Liverpool Royal Infirmary.—Hon. Asst. Surg.
 Liverpool, Royal Southern Hospital.—Hon. P.
 Manchester, Ancoats Hospital.—Hon. Radiologist. H.S. at rate of £100. Also Anæsth. 10s. 6d. per attendance.
 Margate, Royal Sea Bathing Hospital.—H.S. £200.
 Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—H.S. £150.
 New Zealand Government, Mental Hospitals Dept.—Two Asst. M.O.'s. £615.
 Northampton General Hospital.—Hon. Asst. S.
 Norwich, Norfolk and Norwich Hospital.—Res. Anæsth. £150.
 Oldham County Borough.—Asst. School M.O. £600.
 Royal Northern Hospital, Holloway, N.—M.O. in charge of Electro-Therapeutic and Massage Dept. 100 guineas. Also S.
 St. Mark's Hospital for Cancer, &c., City-road, E.C.—Hon. S. Also Hon. Asst. S.
 St. Paul's Hospital for Skin, &c., Diseases.—Hon. Anæsth.
 Salisbury General Hospital.—Hon. S. £150.
 Samaritan Free Hospital for Women.—H.S. £100.
 Southampton, Royal South Hants Hospital.—Jun. H.S. £150.
 Staffordshire Education Committee.—Asst. Sch. Med. Inspect. £600.
 Staffordshire General Infirmary.—H.S. £200.
 Sudan Govt., Wellcome Tropical Research Laboratories.—Asst. Bacteriologist. £E.720.
 West Derby, Liverpool, Alder Hey Children's Hospital.—Male and Female Res. Asst. M.O. Each £200.
 Whittingham, Preston, County Mental Hospital.—Temp. M.O. £7 per week.
 The Chief Inspector of Factories, Home Office, London, S.W., announces a vacancy for a Certifying Factory Surgeon at Torpoint, Cornwall.

Births, Marriages, and Deaths.

BIRTHS.

BROWN.—On June 29th, at "Kingslea," Sutton, Surrey, the wife of Dr. C. Carron Brown, of a son.
 LODGE.—On July 2nd, at Heath Hall, Halifax, Yorkshire, the wife of W. O. Lodge, M.D., F.R.C.S. Edin., of a daughter.

MARRIAGES.

NICHOLLS-SCHUSTER.—On July 2nd, Marriott Fawcner Nicholls, B.A., M.R.C.S., L.R.C.P., son of the late Marriott Nicholls, Esq., to Norah Henriette Schuster, M.B., Ch.B., daughter of Sir Arthur Schuster, Kt., F.R.S.
 THOMAS-RICKS.—On July 1st, at the Parish Church, Cockington, Torquay, by the Rev. H. Studdy, M.A., Clement Price Thomas, F.R.C.S., to Ethel Doris, daughter of Mr. and Mrs. Mortimer Ricks, Paignton, S. Devon.

DEATHS.

FRASER.—On June 30th, Evan J. H. Fraser, M.D., F.R.C.S. Edin., of Hull.
 HARFORD.—On July 4th, suddenly, at Shirley, Harpenden, Charles Forbes Harford, M.D., First Principal of Livingstone College, aged 60.
 HOVELL.—On June 30th, Thomas Mark Hovell, F.R.C.S., of Harley-street and Hatfield, Herts, aged 72.
 N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE ARTIFICIAL SUNLIGHT CLINIC AT KINGSTON-UPON-HULL.

THE first municipal clinic to be established in this country for the treatment of rachitic children by artificial sunshine was opened last year at 69, Coltman-street, Hull. A few months later the city of Liverpool, after sending a deputation to Denmark, set up at their Fazakerley Sanatorium an installation for the treatment of tuberculosis of the bones and joints. The first municipal clinic in London for the provision of treatment by artificial sunlight was opened in St. Pancras during March, and several other clinics are now running in the metropolis.

Procedure at the Hull Clinic.

A report of the Hull clinic has just been published by Dr. W. Allen Daley, medical officer of health, and Dr. Kathleen Gamgee, assistant medical officer for maternity and child welfare. The infants are weighed and measured, their history taken, and their blood tested for hæmoglobin content in rooms on the ground floor. The sunlight treatment is given in a small room (15 feet by 12 feet) on the first floor. Two or three mothers can wait in a small dressing room adjoining the treatment room. The period of exposure of each patient to the ultra-violet rays varies from 3 to 15 minutes. One child only is treated at a time, and is held, without clothing, in front of the arc lamp by a nurse. Another nurse controls the arc lamp, and a third nurse is engaged downstairs. Dr. Gamgee is responsible for the ordering of the time of exposure required for each child, and attends the clinic whenever it is open. The lamp, had it not been presented to the corporation, would have cost about £35; renewal of electrodes has cost £9 16s. 10d., and electricity 18s. 9d.

During the year 110 patients have been treated at the clinic. The children for treatment were selected by the health visitors who, in the course of their home visits, discovered rickety children who had not in most cases attended a maternity and child welfare centre. These children were examined by the assistant medical officer, and if she considered them suitable for treatment they were put upon the waiting list for the artificial sunlight clinic. In the meantime they were given advice with regard to diet and general hygienic treatment, the routine being to prescribe pure cod-liver oil and one pint of milk per day for each child, and, in severe cases, daily tepid sponging and gentle massage by the mothers until the child can be transferred from the waiting list to the artificial sunlight clinic. This treatment has improved the health of the child in cases where the mother is persevering and intelligent, but improvement effected in this way is far more gradual and altogether a slower process than the dramatic changes seen at the artificial sunlight clinic.

Each child is subjected on its first attendance to a careful and prolonged physical examination. It is weighed and measured and its blood tested. The dosage for each child is small at first and increased very gradually. It is remarkable how little skin reaction some of these babies give to doses that quickly cause the skin on an adult to peel. The browning produced by the tungsten arc is not great. Many of these babies become browner after the treatment. They lose their transparent anæmic look, become livelier, and at the same time more peaceful. The first improvement is usually registered by the mother who states, of her own accord, that her baby is more active, but at the same time sleeps more and is far less trouble at home. One of the cardinal symptoms of rickets is the nervousness and irritability of the small patient. It is one of the first symptoms to yield to the artificial sunlight cure properly administered. Another point to note is the rapidity with which the marked anæmia yields to the ultra-violet radiations. Out of 88 cases only 10 cases (four of them cases of grave organic disease) showed no increase in the percentage of the hæmoglobin (red colouring matter) of the blood. In one case, that of a delicate and very anæmic little girl of 4½, who had been under prolonged treatment by private doctors and had been under treatment for some time at the Owen Hall centre, the Hb percentage increased by 100 per cent. at the end of her six weeks' course.

The estimation of the hæmoglobin percentage is most conveniently done by Tallquist's method. Although not a scientifically reliable method, it is a good working scale if done by the same person each time, and it has the advantage of simplicity and quickness and of not alarming the baby more than is absolutely necessary.

Classification and Results.

Up to the time of reporting 110 patients have been treated at the clinic; 24 are still under treatment, and of the

remaining 86, 18 were discharged: because of irregular attendance, 7; development of infectious illness, measles, &c., 10; extreme fretfulness of child, 1.

The remaining 68 cases are divided into the following classes:—

(1) *Severe Rickets*: These cases include some with marked deformity, others with less marked although still obvious deformity, but with severe impairment of general health.

(2) *Slight Rickets*: Including cases of rickets with slight bony deformity.

(3) *Wasting Babies*: No definite rickets.

(4) *Other Conditions*.

(5) *Infantile Paralysis* (anterior poliomyelitis).

The following table sets out the results of treatment:—

—	Number treated.	Much improved.	Improved.	No. change.	Worse.
Severe rickets ..	31	19	10	2	0
Slight rickets ..	22	15	5	2	0
Wasting babies ..	6	5	1	0	0
Other conditions ..	8	0	4	4	0
Old anterior poliomyelitis ..	1	0	0	1	0
—	68	—	—	—	—

Eight cases admitted as suffering from malnutrition or rickets and found to be suffering from grave organic disease (such as kidney disease, tuberculosis, heart disease) were transferred to the children's hospital or to their private doctor. There was a satisfactory attendance, even from those who had to come on two trams, and this indicates that the parents at all events are convinced that their children are improved by treatment at the clinic. The keenness and interest of the mothers is remarkable, and the percentage of cases that have had to be cancelled owing to irregular attendance is very small and is decreasing with each batch of cases treated.

Repeat Courses.

In every case where it is felt that the condition of the child demands it, a repeat course, or even two or three repeat courses (of six weeks' duration each) are given. Experience has taught that it is better to allow an interval of six weeks to elapse before the second repeat course is given. It is very noteworthy how much the child continues to improve in the weeks immediately following the first course of treatment. Re-examination of old cases showed that not only had the good condition of the child been maintained throughout several months, but that it had gone on improving, and the hemoglobin percentage had not gone down, but had maintained the high level reached at the end of the course of treatment.

Requirements of a Sunlight Clinic.

The treatment is now well beyond the stage of trial; arrangements should be made for making it more readily available for all who require it, including not only rachitic and wasted infants, but also cases of tuberculosis of the bones and joints.

The accommodation which would be necessary in a fully equipped artificial sunlight treatment centre would be two rooms for carbon arc treatment—one for males and one for females—and either two large rooms or a number of smaller rooms in which treatment could be given by the tungsten arc and by mercury-vapour lamps. A waiting room would be necessary; also a recovery room, in which the patients could remain after treatment; a medical examination room; a record room; a nurses' room; and an X ray room with developing room and film room attached. Sanitary accommodation for patients and staff would also be required. The staff which would be necessary for a fully developed centre would be a whole-time medical officer, four or five nurses, a clerk, and a porter.

The cost of the electrical apparatus and wiring of the fully developed clinic would be approximately £1000 and an additional £1000 would be required for furnishing. Further cost, of course, would be entailed by the purchase or rent of the building and its adaptation. At first the medical staff need consist only of the services of a part-time medical officer who might train a junior member of the profession, who would eventually be able to take full charge. The other staff, which would be required at first, need not consist of more than two or three nurses, with the necessary clerical assistance.

THE ASFURIYEH MENTAL HOSPITAL.

BEFORE the opening of the Lebanon Mental Hospital at Asfuriyeh the treatment of mental disease in Syria was entirely in the hands of native priests and exorcists whose cruel and ignorant methods usually aggravated greatly the sufferings of their unfortunate victims. Theophilus Waldmeier, the founder and first superintendent of the above hospital, had a remarkable career. Born in

Switzerland, he passed from Roman Catholicism, through ecclesiastical Protestantism to Quakerism. He was a missionary to Abyssinia in the days of King Theodore, whose friend he became. He suffered imprisonment at the hands of the king and for a time his life and that of other prisoners was in grave danger. From Abyssinia he passed to Syria, where, on Mount Lebanon, he eventually founded the Friends' Syrian Mission, turning from that, after some 25 years, to the founding of the mental hospital.

The twenty-sixth annual report of this institution records considerable financial difficulty in carrying on the work, many old supporters having been lost by death. During the year 141 patients were admitted, making a total of 228 under care, and there has been a gratifying freedom from accident and infection. Every effort is made to keep the patients occupied and an electro-therapeutic plant has been installed. The dementia præcox and manic-depressive groups of psychoses account for the vast majority of admissions, and in Syria, as in this country, the principal causes assigned for the mental breakdown are mental stress, syphilis, and heredity. The recovery-rate is 21 per cent., with a further 15 per cent. discharged relieved.

THE TRAINING OF HEALTH VISITORS: CENTRAL EXAMINING BODY.

ON April 1st last the administration of Exchequer grants for the training of health visitors was transferred from the Board of Education to the Ministry of Health. The conditions on which grants are now made by the Minister of Health were set out in THE LANCET of Feb. 21st (p. 420). Students will be required to enter for an examination to be conducted by a central examining body, and the Minister has now approved the Royal Sanitary Institute as this examining body. The Institute will conduct the examinations for health visitors in accordance with the conditions prescribed in Memo. M.C.W. 101, and will issue certificates to candidates who pass the examination and who satisfy the other conditions specified in the memorandum. The diploma issued to students who, before April 1st, 1925, began a course of training approved by the Board of Education, will be regarded as equivalent to the health visitor's certificate. Communications should be addressed to the Secretary, The Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1.

THE MISSION TO LEPERS.

FOUNDED in 1874, the Mission to Lepers has now published its fiftieth annual report. Nearly 8000 lepers are being supported wholly or partly by the funds of this mission, and over 700 untainted children are being kept and educated in separate homes. The nature of the work has wholly changed since its inauguration owing to the curative treatment now possible. The new treatment is being given at an increasing number of the homes and many lepers have been discharged cured. Dr. R. M. Wilson reports from Korea that chaulmoogra oil and camphor have been found to give better results than the esters. The importance of treating predisposing causes such as hookworm, typhoid, syphilis, and kala-azar is being increasingly realised. The chief need is to find some way of attracting the early cases; a small patch of anaesthesia is liable to be concealed because of the ostracism that must follow its discovery. The Mission has appointed a special secretary for medical work, Dr. Robert G. Cochrane. During the last year Dr. Thomas Cochrane has conducted a world survey of leprosy, which has emphasised the urgent need for new work in Africa.

THE GROWTH OF A HOSPITAL.

IN support of the appeal for the extension of the nurses' home of the Manchester Royal Infirmary an interesting illustrated booklet has been issued setting forth the various stages in the growth of the infirmary. There is a picture of "The Publick Infirmary" in Manchester, opening on the 24th day of June, 1752, and this is followed by a view of the "Daub Hole Fields Infirmary" as it appeared in July, 1755. Then follow pictures of the "Old Infirmary" and its successor. A comparison between the staffs and patients in July, 1752, and in 1924 is shown in the following table:—

	1752.	1924.
Beds	12	750
Medical staff non-resident ..	—	23
Nurses	1	233
Porters	1	21
Domestic staff	1	141
In-patients	75	12,386
Out-patients	249	42,348

DONATIONS AND BEQUESTS.—Mr. Solomon Whitta, Bowes-park, N., who left estate valued at nearly £11,000, bequeathed the bulk of the estate for equal division between the London Hospital, St. George's Hospital, the Royal Northern Hospital, Holloway-road, N., and the Hospital for Women, Soho-square, W.C.

New Research

INTO THE

ORIGIN OF CANCER.

[The two communications which follow mark an event in the history of medicine. They form a detailed description of a prolonged and intensive research into the origin of malignant new growths, and they may present a solution of the central problem of cancer.]

THE ÆTIOLOGY OF MALIGNANT NEW GROWTHS.

By W. E. GYE, M.D. EDIN.

(From the Medical Research Council's Field Laboratories,
Mill Hill, N.W.)

INTRODUCTION.

IN 1911 Peyton Rous¹ described a sarcoma of the fowl which differs from mammalian tumours in one very important way—namely, that it can be transferred from chicken to chicken by inoculating dead cells, killed by drying or with 50 per cent. glycerol, or by means of a cell-free Berkefeld filtrate. The mammalian tumours, with the possible exception of a lymphosarcoma of dogs,* have so far been transferred only by inoculating living cells. This chicken tumour—No. I. in the series examined by Rous—is a spindle-celled sarcoma which metastasises freely and generally kills the host within 28 days. The malignancy of the tumour has increased with passage. It cannot be transferred to mammals or to any other species of birds than the hen, either by inoculating living cells or filtrates. Its specificity at first was exceptionally strict; successful transplantations of the tumour could be obtained only in blood relations of the bird—a Plymouth Rock—in which the original tumour occurred. The tumour now grows freely in other varieties of fowls, but the Plymouth Rock is still by far the most suitable variety of bird for experimental study.

A second filterable tumour of the hen was described by Rous² in 1912 (Tumour VII.). This tumour is an osteochondrosarcoma. The primary growth was benign, but it proved to be transplantable and with repeated passage became malignant. It differs from tumour No. I. not only in its histology, but also in its general behaviour, rate of growth, site of metastatic deposits, &c. It can be transferred with dead cells or with filtrates.

The third of these filterable tumours—No. XVIII.—was described by Rous in 1914.³ It is a spindle-celled sarcoma with blood sinuses into which growth occurs. The tumour may be propagated with living cells, or with Berkefeld filtrates, but not by means of the dried tumour.⁴

There are, then, three well-described filterable tumours—all sarcomata and all growths of hens—among many thousands of animal tumours which have been transplanted and studied. It is very improbable that every neoplasm which has been described has been tested thoroughly as to its filterability, and it is therefore possible that one or more filterable tumours have been overlooked. But

the general statement may be made: First, that no mammalian tumour has been propagated by cell-free filtrates; secondly, that a large number have been tested with entirely negative results; and thirdly, that if filterable mammalian tumours occur they are exceptions to the general rule. Thus the filterable chicken sarcomata differ, apparently, fundamentally from other tumours. This difference has led to expressions of doubt as to their being true new growths. It is unnecessary to discuss this point, as the work to be described will show, but it must nevertheless be pointed out that Rous studied the filterable tumours most carefully and showed clearly that they answer every valid test which has been put forward as a criterion of new growths. Indeed, no set of tumours has been more thoroughly studied from this point of view. In my judgment the classical papers published by Rous between 1911 and 1916 settled this point conclusively.

The problem which remained when Rous concluded his work on these tumours was the determination of the nature of the filterable agent. Rous and his collaborators brought forward strong evidence in favour of its being a filterable virus—a living but extremely small microbe. Thus the agent is destroyed by exposure to a temperature of 55° C. for 15 minutes; by chloroform and toluene; by phenol in concentrations as low as 0.5 per cent., and by other antiseptics; and the tumour may be kept immersed in glycerine and it still retains its infectivity. In spite of this evidence Rous used the term "agent" rather than "virus," since the final proof that the agent is animate its cultivation outside the body was missing.

The work which is to be described in this paper began with the study of chicken sarcoma No. I. Before plunging into details of this work a few words on the parasitic hypothesis of the origin of tumours may not be out of place.

The "parasitic hypothesis" of cancer may be stated briefly as follows: Malignant new growths constitute a specific disease and have as their essential cause a specific parasite. To some advocates the parasite is a microbe—e.g., the *Micrococcus neoformans* of Doyen; to others a protozoon; to others again, it is a new form of organism which is capable of existing as "unorganised plasm," as a filterable virus, in coccal or bacillary forms or as a fungus.

The opponents of the parasitic hypothesis—and they are chiefly those who have devoted themselves to cancer research—have no difficulty in refuting the theory in the form in which it has been presented. In the first place there has been no agreement amongst the advocates as to which of the many organisms brought forward as the "cause" of cancer is the true one, and in the second place it has never been possible to reproduce a tumour with a culture of any one of the organisms. Further, when all the definite knowledge we possess on malignant disease is arranged in due order an impressive case can be made out against the general conception that malignant disease has an extrinsic specific cause. The evidence, however, is largely negative, and is really only destructive of the view that tumours are the pathological consequence of the simple conjunction of host and parasite.

The Rous group of filterable tumours has been an embarrassment to both sides. Those who oppose the parasitic hypothesis have been content either to regard these tumours as entirely exceptional—a view that by implication rejects the concept of new growths as a homogeneous, specific disease and places them as a consequence amongst the inflammations—or to deny that the tumours are true new growths. Those who favour the parasitic hypothesis have inclined to ignore the Rous tumours for different reasons; these tumours make the theory too complicated altogether.

One of the outstanding features of new growths is their specificity. A tumour of the mouse, transplanted in fragments of living cells, will not grow in the rat or vice versa. The species specificity is very strict.

* During the year 1924 I collaborated with the late Dr. B. R. G. Russell in the study of this tumour. The work has been continued in conjunction with Dr. A. M. Begg, and the results will be given in another paper.

It may be argued that this is probably an example of general cellular specificity and is therefore not a particular property of tumour cells. And the argument is probably sound. But cell-free filtrates of the chicken sarcomata are just as strictly specific; they are incapable of producing a tumour in any bird save the hen, and much less in a mammal. Moreover, the filtrate from each tumour reproduces only a tumour of the same structure and general behaviour as that from which it is derived. The specificity, in other words, applies not only to the species but even to tissues. If we accept the conclusion that these tumours are caused by living viruses and argue—justifiably—therefrom that other tumours have similar causes, we are inevitably driven, in the present state of knowledge, to the conclusion that for every species of animal there is at least one group of viruses and for every tissue a particular virus. We are thus led by the logical application of undisputed facts to an apparently absurd position. It does not require a penetrating insight into pathological problems to see that an essential fact is missing and that its discovery may be the key to the general problem of tumours.

This strict specificity, to which is probably related the conspicuous and unique cellular phenomena which are so attractive to pathologists, forms the chief obstacle to all attempts to connect ætiologically the great variety of tumours of so many species of animals with one external agent or class of agent. The complete failure to provide a unifying conception of the disease has led cancer specialists to look upon the malignant transformation of a cell as a physiological reaction—or a perversion of a physiological reaction—to long-continued irritation. In other words, the disease is regarded as a particular problem in cell physiology, and however clearly external agents may be demonstrated as factors in the chain of causation of tumours their influence is considered to be entirely subsidiary to internal cellular capacities, and particularly to those which relate to cell division. In the final analysis of the pathology of tumours all this may turn out to be true, but as relatively little is known in this branch of physiology it is premature to indulge in speculation.

I have no desire in the present preliminary publication to discuss the very numerous theories, some of which are merely fantastic, which have been advanced to explain the origin of tumours. It is sufficient to draw attention to this conflict of opinion on the parasitic hypothesis. The work which I now report, and which has been carried on during the last two years, provides, I think, the reconciliation of the two views.

TECHNICAL NOTES.

1. *Filtration*.—An exaggerated importance has been attached to the filterability of a virus. This is reflected in the common use of the term "filterable virus" as a description of the whole class of very small organisms. The objections to the term come from two sides: first, the relatively gross spirochaetes pass through bacterial filters readily, and cannot on any grounds be classed with the very small organisms which are invisible, or which, at least, cannot be resolved with the best microscopes in common use; and, secondly, for various reasons, some undoubted viruses are not filterable under the conditions in which they occur. The virus of vaccinia, for example, as it occurs in calf lymph is not filterable; also, the virus of herpetic encephalitis as it occurs in the brain tissue of rabbits is held back by filter candles. Filterability is determined by a number of factors, one of the most important being the properties of the fluid in which the virus is suspended. This is shown very easily with the Rous chicken sarcoma No. 1. If the disintegrated tumour be insufficiently diluted, or if the diluent employed be distilled water, the filtration is difficult and the filtrate is generally non-infective.

The best method of obtaining an infective filtrate is as follows. Healthy tumour tissue is selected and

is minced with sharp scissors; the mince is then rubbed with sterile sand in a Wedgewood mortar in order to break up the cells. This is done very thoroughly. Saline or Ringer's fluid is then added to the mass in the proportion of 100 c.cm. to about 1 g. of tumour. After mixing thoroughly the muddy suspension is filtered under gravity through layers of paper pulp and sand, arranged in a long tube-filter, in order to remove sand and remnants of tissue. The filtrate thus obtained—the "sand filtrate"—is usually a faintly yellow transparent fluid, which passes, under moderate pressure, through a Chamberland L₂ or a Mandler candle with ease. The final "candle filtrate" when inoculated into a chicken in a dose of 1 c.cm. causes the formation of a tumour which is palpable in 14 days and almost always kills the chicken within 28 days. Rous showed that the addition of kieselguhr promotes the development of the new growth. In all the experiments described later a trace of silica has been added to the inocula.

2. *Media*.—In the course of this work a large variety of media has been prepared and tested. The formula of one only, that which has proved most satisfactory, will be given. The basis of the medium is Hartley's broth⁵ to which is added 0.2 per cent. KCl. The broth is tubed in 5 c.cm. lots and is sterilised by steaming—never in the autoclave. To each tube of 5 c.cm. is added 1 c.cm. of fresh rabbit serum, after which the tubes are incubated at 37° C. for two days in order to test sterility. When sugars are required the sugar is added to the broth in bulk to give a concentration of 0.5 to 1 per cent.

3. *Aseptic Excision of Tumours*.—Bacteriological technique which involves the use of fresh animal tissue is complicated by the occurrence, especially after prolonged incubation, of contaminations. With chicken tumours the common contaminant is a white staphylococcus; with mouse tumours a Gram-negative bacillus; with rat material a Gram-negative bacillus sometimes occurs and about as often a streptococcus which under anaerobic conditions is very small, but which on solid media, incubated aerobically, assumes a larger size. When contaminations occur attempts to produce a tumour fail; in mice and in rats abscesses often follow the inoculation of material which is slightly infected.

When tubes have been incubated anaerobically it is not always immediately evident that a tube is contaminated; turbidity is not by any means constant. A state of affairs is attained which might be called "concealed contamination," the contamination being revealed only by means of subcultures, aerobic and anaerobic, in broth and on agar.

The following technique has been followed in order to reduce these contaminations to a minimum. The tumour-bearing animal is killed with chloroform or coal-gas and the carcass is then soaked in warm 2 per cent. lysol for five minutes. The subsequent procedures are carried out in a sterile room. The animal is pinned out on a sterile cork slab and the skin reflected so as to expose the tumour, the cutting of the skin and necessary dissection being performed by means of a cautery. After searing the surface, pieces of tumour are excised by means of a dry sterile knife and are dropped into tubes of medium. Unless such strict precautions are taken contaminations occur with disheartening regularity.

EXPERIMENTAL STUDY OF ROUS CHICKEN SARCOMA NO. 1.

It has already been remarked that the injection of 1 c.cm. of a Chamberland L₂ candle filtrate is followed by the formation of a tumour which appears in a fortnight and kills within a month. When the infectivity of such a filtrate is tested with doses of varying size it is shown that a proportionality between size of dose and time of appearance of tumour exists. This is well shown in the following protocol.

Experiment June 20th, 1923.—Chickens were inoculated with L_2 filtrate, all into the pectoral muscle, in quantities indicated in Chart 1. This experiment, modified in various ways, has

CHART 1.

CHICK	INOCULUM	DAY				
		7TH	14TH	21ST	28TH	35TH
5	1cc L_2 FILTRATE.	—	●	●	† 22ND DAY.	
6	0.5cc L_2 FILTRATE + 0.5cc SALINE.	—	●	●	●	† 35TH DAY.
7	0.25cc L_2 FILTRATE + 0.75cc SALINE.	—	—	●	●	●
8	0.1cc L_2 FILTRATE + 0.95cc SALINE.	—	—	—	—	—
9	0.01cc L_2 FILTRATE + 0.99cc SALINE.	—	—	—	—	—

In the second column of this chart, Chick 8, for 0.95 read 0.90.

been repeated over and over again and the result is constant with filtrates through close candles. The interpretation of the result is not possible without a count of the number of organisms per c.cm. in the infective fluid. Superficially it appears to support the view that the infective "agent" is a chemical substance, since proportionality, in such narrow limits, between dose and effect is not characteristic of living microbes.

INFECTIVITY OF "PRIMARY CULTURES."

A primary culture—a term of convenience—is obtained by placing a fragment of tumour in a tube of medium. The infectivity of the supernatant fluid is retained for a variable length of time depending upon the medium employed and the method of incubation. Retention of infectivity is favoured by anaerobiosis; the more completely oxygen is removed the longer the fluid remains infective. Similarly, the addition of rabbit serum to the broth helps to preserve infectivity. The findings may be summarised as follows:—

(1) When a piece of tumour—roughly 0.5 g. in weight—is dropped into 5 c.cm. of broth and the tube is incubated aerobically at 37° C., the supernatant fluid may remain infective in doses of 1 c.cm. for as long as two days. If the tube is incubated anaerobically the infectivity remains as long as four days, particularly if, before incubation, the air dissolved in the medium or "entangled" in the piece of tumour be removed by means of a Geryk pump.

(2) When the medium contains rabbit serum—5 c.cm. of KCl broth to which has been added 1 c.cm. of sterile serum—infectivity is retained after three days' incubation aerobically. If the aerobiosis be increased by using an Erlenmeyer flask instead of a test-tube infectivity is lost sooner. If a piece of tumour is placed in serum broth and the culture incubated anaerobically the supernatant fluid remains infective often for as long as seven days.

(3) When glucose, maltose, or lævulose are added to the medium an acid reaction occurs, the pH rising often as high as 4.0 to 4.5. With mannite, sucrose, galactose, lactose, dulcitol, and salicin fermentation does not occur. The addition of a fermentable sugar tends to increase the time during which infectivity is retained, provided the acidity produced is not too great.

This summary of results of experiments with primary cultures is illustrated by the protocols below, but it must be noted that the size of the piece of tumour added to the medium is of primary importance. If a large mass of tumour—e.g., 2 g.—be added and the culture be incubated aerobically, then it is often possible to produce a tumour with the clear supernatant fluid after as long as seven days' incubation at 37° C. The general impression derived from a long experience of such cultures is that an "agent" diffuses from the tumour tissue and that it disappears slowly in the presence of

rabbit serum and under anaerobic conditions, and more rapidly in the presence of oxygen and absence of serum. The larger the piece of tumour the greater the quantity of "agent" to diffuse, and consequently the longer the infectivity is retained.

Experiment Nov. 6th, 1923.—Chicken 44 was inoculated in the right pectoral muscle with 1 c.cm. of a culture made by adding a fragment of tumour (about 0.5 g.) to 5 c.cm. of glucose broth, the tube being incubated aerobically for

CHART 2.

CHICKEN 44	DAY				
	7TH	14TH	21ST	28TH	35TH
RIGHT BREAST	—	—	—	—	—
LEFT BREAST	—	—	●	●	† 40TH DAY.

three days at 39° C.; in the left breast with 1 c.cm. of an aerobic culture in rabbit serum glucose broth, incubated three days at 39° C. (Chart 2). Post mortem, there was no tumour in the right breast; in the left a large tumour.

This experiment shows that serum tends to preserve infectivity.

Experiment Dec. 27th, 1923.—Two sterile Erlenmeyer flasks were taken; into each 5 c.cm. of rabbit serum glucose broth were placed. A piece of tumour tissue was now placed in the medium in each flask. One flask was incubated aerobically for three days at 39° C., the flask being covered

CHART 3.

CHICKEN 47	DAY			
	7TH	14TH	21ST	28TH
RIGHT BREAST	—	—	—	—
LEFT BREAST	—	●	●	† 22ND DAY.

with a rubber cap to prevent evaporation; the second flask was incubated anaerobically for three days at 39° C. Chicken 47 was then inoculated in the right breast with 1 c.cm. of the aerobic culture and in the left breast with the anaerobic culture (Chart 3). Post mortem, there was no tumour in the right breast; in the left a large tumour.

This experiment shows the advantages of anaerobiosis.

DESTRUCTION OF THE AGENT WITH CHLOROFORM.

Rous⁶ showed that carbolic acid, toluene, and chloroform all destroy the agent in a relatively short space of time. I have confirmed all his statements, but here I wish particularly to describe the method of rendering "sand filtrate"—which will produce a tumour in doses of 0.05 c.cm.—innocuous by treatment with chloroform.

Healthy tumour tissue is taken and is disintegrated with sand. The mass is then mixed with Ringer's fluid, the volume of fluid used being 100 c.cm. to about 5 g. of tumour. The mixture is filtered through well-packed paper pulp and sand and the filtrate should be quite transparent. Ten c.cm. of the clear sand filtrate is placed in a boiling tube by means of a pipette. The fluid is delivered neatly to the bottom of the tube without wetting the sides. A few drops of chloroform are then run down the sides of the tube, which is held in a slanting position. In this way, although some of the chloroform sinks to the bottom of the tube to form globules, a portion remains for a time as a thin film on the surface. The tube is then placed in a beaker of water, the temperature of which is 37° C., and is kept in the incubator. After half an hour has elapsed the chloroform globules are taken up in a Pasteur pipette and mixed repeatedly with the bulk of the filtrate. The object of this manoeuvre is to facilitate the saturation of the fluid with chloroform. The tube is again incubated in water kept at 37° C., and is left until three hours' incubation has been completed. The chloroform is then removed completely by means of a Geryk pump. "Sand filtrate" which has been treated in the above fashion now fails to infect in doses of 2 c.cm., whereas a control tube treated

similarly, but with saline instead of chloroform, is still infective in doses of 0.2 to 0.25 c.cm.

The following experiment shows the importance of temperature and of complete saturation of the filtrate with chloroform in the destruction of the virus.

Experiment Dec. 12th, 1923.—Chicken 49 was inoculated with 1 c.cm. sand filtrate which had been saturated with chloroform and kept at a temperature of 37° C.; Chicken 50 with 1 c.cm. of the same filtrate which had been saturated with chloroform and kept at room temperature; Chicken 51 with 1 c.cm. of the same filtrate incompletely saturated with chloroform and kept at 37° C. for three hours (Chart 4).

CHART 4

CHICKEN	DAY				
	7 TH	14 TH	21 ST	28 TH	35 TH
49	—	—	—	—	—
50	—	—	•	•	† 33 RD DAY.
51	—	—	•	•	† 38 TH DAY.

For the rapid destruction of the virus the filtrate must be saturated with chloroform and the temperature be kept in the neighbourhood of 37° C. It is to be noted that it is insufficient merely to place the tube in the incubator and expect the contents to attain the temperature in a short time; the tube must be placed in water at the required temperature.

EXPERIMENTS TO SHOW THAT TWO FACTORS EXIST IN INFECTIVE FLUID.

Experiments have already been described in which it is shown that "primary cultures" in broth and in rabbit serum broth become non-infective in two to seven days, the time depending upon the amount of tumour tissue, the composition of the medium, and the conditions of incubation. From the beginning of this work on the Rous sarcoma I suspected that this loss of infectivity does not depend upon the death of a virus, but upon the disappearance of an accessory chemical factor which governs infection of cells. The following experiment shows that this is true. The accessory factor, a product of tumour cells, is obtained by killing the virus in a "sand filtrate" with chloroform in the manner already described. The suspension of the virus consists of a non-infective primary culture.

Experiment Jan. 14th, 1924.—A culture was made by placing a fragment of healthy tumour tissue in 5 c.cm. of rabbit serum glucose broth, contained in a small Erlenmeyer flask, and incubating aerobically at 37° C. for three days. Clear "sand filtrate" was treated with chloroform in the manner already described and the chloroform removed completely under the pump. Chickens were now inoculated as shown in Chart 5.

CHART 5

CHICK	INOCULUM	DAY					
		7 TH	14 TH	21 ST	28 TH	35 TH	42 RD
66	1 cc CULTURE.	—	—	—	—	—	—
67	1 cc TREATED FILTRATE.	—	—	—	—	—	—
68	0.5 cc CULTURE + 0.5 cc FILTRATE	—	—	•	•	•	† 38 TH DAY.

It is clear from this experiment, one of many, that a tumour extract—the "sand filtrate"—treated with chloroform and thereby rendered innocuous has a property which, when aided by a property of an inert primary culture, can bring about the formation of a neoplasm. The interpretation of these results, which were first obtained in a rather different form in November, 1923, is as follows. The chloroform-treated "sand filtrate" contains a labile chemical substance which in some way, as yet unknown, renders the cells susceptible to infection by the virus contained in the primary culture. The proof that this is an accurate conception of the process will be made clear later.

The existence of two factors in primary cultures can be shown by means of the centrifuge.

SPINNING EXPERIMENTS.

The interpretation of the results obtained with infective fluids which are spun at high speed depends in a large measure, but not entirely, upon the fact that a proportionality exists between size of dose and effect. This is illustrated by the following experiment.

A "primary culture" in rabbit serum glucose broth, incubated at 39° C. anaerobically in a McIntosh and Fildes tin for five days, was taken and the clear supernatant fluid pipetted off without disturbing the tumour tissue at the bottom of the tube. The acidity of the fluid was between pH 5.0 and 5.5. The fluid was spun in a conical tube for two hours at a speed of 9000 revolutions per minute. Rather more than 1 c.cm. of the top layer of the spun culture was then taken off with a Pasteur pipette, the greatest care being taken to avoid disturbing the small amount of deposit at the bottom of the tube. Next, 1 c.cm. was taken from the lowest layers, the deposit being included. A chicken was then inoculated in the right breast with 1 c.cm. of the fluid from the top layer, and in the left breast with 1 c.cm. from the lowest layer. The chicken died in 20 days and when examined post mortem the tumours in the breasts were relatively as indicated in the chart here given (Chart 6).

CHART 6

7.2.25.			
RIGHT BREAST	→	•	← LEFT BREAST

Such an experiment has been taken to indicate a "shift" of the particulate agents, whether purely under centrifugal force or whether as part of a general shift of large colloid protein masses which form in medium containing tissue. In an ordinary infective disease, the clinical signs of which are elevation of temperature, appearance of a rash or vesicles, and so on, a delay in the appearance of signs would be more difficult to interpret. But with a tumour which always occurs locally at the site of injection and which manifests itself as a swelling, the hazards are less.

With candle filtrates and with five-day cultures in media which do not contain fermentable sugars—i.e., when the pH is 7.8 to 7.9—the shift of virus is so small as to be open to doubt. The effect of acidity in aiding spinning is thus very great; all attempts to spin out the virus completely, even with acid cultures, in this way have failed. An additional advantage is obtained by lining the centrifuge tubes with a thin film of nutrient agar. The agar becomes detached during spinning and, when the machine is stopped, it is found at the bottom of the tube. The exact part which agar plays has not been determined, but it was first employed to provide a material upon which it was imagined the virus would stick firmly. This, however, may be passed over for the present; the fact is that by using agar films acid infective fluid can, by a short period of spinning, be rendered inert in doses double and often treble the usual infective dose, as the following experiment indicates.

Experiment Feb. 7th, 1925.—A portion of a five-day culture of a tumour in rabbit serum maltose broth was spun for 35 minutes in a tube lined with agar. The pH of the culture

CHART 7.

CHICKEN 144	DAY			
	7 TH	14 TH	21 ST	28 TH
RIGHT BREAST	—	—	—	—
LEFT BREAST	—	•	•	•

had increased from 7.8 to 5.0 during incubation. After spinning, Chicken 144 was inoculated in the right breast with 1 c.cm. of the supernatant fluid; in the left breast with 0.5 c.cm. of the portion of the culture which had not been spun. Chart 7 shows the result. Post mortem, there was no tumour in the right breast.

When the deposit which is obtained by spinning a five-day anaerobic primary culture in rabbit serum glucose broth is washed twice with saline, it is found that the final emulsion of deposit is inert. This might readily be supposed to be because the virus has been washed away. It is not so, however, as can be proved by inoculating a chicken with a mixture of washed deposit and innocuous supernatant fluid, when a tumour forms in the usual time. This is well shown by the following experiment:—

Experiment Sept. 2nd, 1924.—Five-day anaerobic cultures in rabbit serum glucose broth were taken and spun in four conical centrifuge tubes, two of which were lined with agar and two were not. The first spinning was for 40 minutes at 9000 revolutions; the topmost layers were pipetted off from the two agar-lined tubes—in all 4 c.cm. were taken—and put aside. The fluid in the two remaining tubes was pipetted off with care, leaving only the small amount of deposit which had formed. The deposit in each tube was mixed thoroughly with 5 c.cm. of saline and the two tubes again spun at 9000 r.p.m. for 40 minutes. Again the fluid was removed and the deposit mixed with saline and the mixture spun. In this way the deposit was washed twice. It was finally emulsified in 1 c.cm. of Ringer's fluid and the following experiment performed.

Chicken 150 was inoculated with 2 c.cm. of the fluid taken from the agar-lined tubes; Chicken 151 with 0.6 c.cm. of washed deposit plus 0.8 c.cm. Ringer; Chicken 152 with 1 c.cm. of fluid from the agar-lined tubes to which was

CHART 8

CHICK	INOCULUM	DAY				
		7 TH	14 TH	21 ST	28 TH	59 TH
150	2 cc SUPERNATANT FLUID.	—	—	—	—	—
151	0.6 cc WASHED DEPOSIT.	—	—	—	—	—
152	1 cc SUPERNATANT FLUID + 0.4 cc WASHED DEPOSIT.	—			† 20 TH DAY.	

added 0.4 c.cm. of washed deposit. Chart 8 shows the result of the experiment.

Chickens 150 and 151 were killed on Oct. 31st, 1925—the fifty-fourth day—and there were no signs of a tumour.

It is not easy to obtain such a perfectly clean result. A more frequent result is indicated in the next experiment.

Experiment Dec. 13th, 1924.—Spinning and washing were carried out as before. Chicken 15 received 1.5 c.cm. of supernatant fluid from agar-lined tubes; Chicken 16 received 0.5 c.cm. of washed deposit plus 0.5 c.cm. Ringer;

CHART 9

CHICK	INOCULUM	DAY		
		15 TH	18 TH	24 TH
15	1.5 cc SUPERNATANT FLUID.	—	—	•
16	0.5 cc WASHED DEPOSIT + 0.5 cc RINGER'S FLUID.	—	—	—
17	0.75 cc SAND FILTRATE + 0.25 cc WASHED DEPOSIT.			† 25 TH DAY.

and Chicken 17 received a mixture of 0.75 c.cm. supernatant fluid and 0.25 c.cm. washed deposit. The result was as shown in Chart 9.

Chicken 15 eventually died on Feb. 2nd, 1925, 51 days after being inoculated; Chicken 16 was killed three months later and there was no sign of a tumour.

These experiments have been carried out 15 times; in two instances the cultures proved to be non-infective—in each case there was a “concealed contamination”; in two experiments tumours have developed in the chicken inoculated with washed virus, once after 30 days and once after 28 days. The remainder of the experiments are fairly represented by the protocols given.

When candle filtrates of a tumour are taken, made acid with NaH_2PO_4 , and spun in the same way the results obtained are of the same kind, but it is more difficult to render the fluid in the agar-lined tubes non-infective.

Experiment Nov. 11th, 1924.—A tumour filtrate (Mandler candle) was acidified with NaH_2PO_4 , the pH being brought to 5.5. The acidified filtrate was then spun, the deposit in the two tubes being washed, as in the protocols already given (Chart 10). Post mortem, it was found that the

CHART 10

CHICK	INOCULUM	DAY			
		7 TH	11 TH	14 TH	21 ST
184	2 cc SUPERNATANT FLUID.	—	—	•	† 21 ST DAY.
185	RIGHT BREAST: 0.6 cc WASHED DEPOSIT + 0.7 cc SALINE.	—	—	—	—
	LEFT BREAST: 1 cc SUPERNATANT FLUID + 0.3 cc WASHED VIRUS.	—			† 21 ST DAY.

tumour in Chicken 184 had penetrated the peritoneal cavity into which hæmorrhage had occurred, causing death. The tumour in Chicken 185 was confined to the pectoral region and was much larger than that in Chicken 184.

It will be noted that my practice has been to give double doses of supernatant fluid and washed virus when these are inoculated separately. This, of course, is the recognised safe method of control. If, however, the first and third chickens of an experiment be inoculated with the same volume—usually 0.75 c.cm.—of supernatant fluid diluted with Ringer's fluid for the first chicken and washed virus for the third; then the results are similar to those shown in the first protocol (Experiment Sept. 2nd, 1924).

The experiments show that both in primary cultures and in candle filtrates of the tumour there are two factors which are necessary to the production of a tumour; the one is particulate and is therefore probably a virus; the other, being uninfluenced by spinning, is probably a chemical substance. Neither of these factors operating alone will cause the formation of a sarcoma.

The bearing which these findings have upon the pathology of the Rous tumour and, as will be shown, upon tumours generally, is most important. To return to the central difficulty of tumour ætiology, specificity. It seems to me obvious that, since the virus alone is not infective, the specificity of the Rous tumour must be carried by the second—the chemical—factor derived from cells. (That it is not a toxin or other product of culture is evident from the results of spinning candle filtrates of tumours and from the fact—shown later—that subcultures alone are not infective.) It is very probable that the virus of the Rous tumours VII. and VIII. is the same as that of No. 1†; the chemical factor in each case would, I presume, be different. In this way the specificity is again related to the cells, but in the case of the filterable tumours, to a cell derivative which can be separated from the cells. I propose to call this chemical substance the “specific factor.”

At this point it is convenient to refer to attempts to stain and see the virus. Most of the stains recommended for the study of small organisms have been employed in this research. Giemsa's fluid in particular has been thoroughly tried. In order to obviate repetition in the later parts of this paper it is as well to state at the outset that all attempts to stain and see the virus, using for the purpose a 2 mm. apochromatic lens with eye-pieces ranging from 6 to 20, have failed. The “granules” which can be stained in films made from a medium containing tissue have been seen but that they are not the virus is shown by the following observation. A film was made from a five-day primary culture of the Rous tumour in rabbit serum glucose broth; a chicken was then inoculated with 1 c.cm. of the culture. Next the culture was spun at 9000 revolutions per minute for

† This cannot now be tested as the tumours VII. and VIII. have been lost. Dr. Rous very courteously sent me dried powder of the tumours, but they proved to be inert.

40 minutes in an agar-lined tube. The upper part of the fluid was removed with a pipette and a film made; 1 c.cm. of the fluid was then injected into a chicken which did not develop a tumour; the chicken inoculated with the unspun fluid died of a large tumour three weeks later. The films were passed through fixative together and then stained together with Giemsa's long method; both showed innumerable pink granules on the border-line of resolution. Such experiences as these have led me to the opinion that such granules are not the virus. The visual discovery of such small organisms is obviously a special problem in optics. Fortunately, my colleague, Mr. J. E. Barnard, F.R.S., has undertaken this work. His report upon it follows this paper.

THE CULTIVATION OF THE VIRUS IN VITRO.

Whilst the results of spinning experiments show that one factor in the tumour-producing filtrate is particulate and is therefore probably a virus, the proof of multiplication in vitro is essential for the final justification of this conclusion. To describe completely the attempts, successful and unsuccessful, to cultivate the virus would expand this paper unreasonably; details will be left to the technical journals. Here it is sufficient to say that the most useful medium employed is that which has been described already. To 6 c.cm. of rabbit serum KCl broth a fragment of chick embryo is added. The age of the embryo used has generally been 12-16 days. The tube is then inoculated with a loopful of primary culture and is now called the first subculture. It is incubated in an anaerobic tin at 35°-36° C. for four days, when the second subculture is made into similar medium containing freshly removed embryo. The maximum growth as judged by the results of experiments on chickens is obtained on the fourth to fifth day of incubation.

The dilution with each subculture is at least a thousand times; in a fifth subculture, therefore, the original inoculum has been diluted 10^{15} , or a thousand billion times. If tumours are produced with subcultures beyond the fifth we may be certain that growth has taken place. The following protocols show results obtained with such subcultures.

Experiment Sept. 18th, 1924.—Chicken 157 was inoculated with 1 c.cm. of sand filtrate which had been treated with chloroform; Chicken 158 with 1 c.cm. of a fifth subculture of

CHART 11

CHICKEN	DAY			
	8 TH	14 TH	21 ST	42 ND
157	—	—	—	—
158	—	—	—	—
159	—	●	●	† 23 RD DAY.

the tumour virus; Chicken 159 with 0.5 c.cm. of the sand filtrate plus 0.5 c.cm. of the fifth subculture. The results are seen from Chart 11.

Experiment Dec. 4th, 1924.—On Dec. 2nd, 1924, fragments of tumour were placed in tubes of glucose broth and the tubes incubated anaerobically in a McIntosh and Fildes tin for two days at 39° C. On Dec. 4th supernatant fluid was taken from the tubes without disturbing the tumour

CHART 12

CHICK	INOCULUM	DAY			
		14 TH	21 ST	28 TH	52 ND
206	1 cc SUPERNATANT FLUID.	—	—	—	—
210	0.5 cc SUPERNATANT FLUID + 0.5 cc OF A FIFTH SUBCULTURE OF VIRUS.	—	●	●	† 31 ST DAY.
211	2 cc OF THE SAME FIFTH SUBCULTURE OF VIRUS.	—	—	—	—

tissue. The fluid was spun in agar-lined tubes for an hour and three quarters at 9000 revolutions, and the supernatant fluid pipetted off. Chickens were then inoculated as shown in Chart 12.

Experiment April 27th, 1925.—In this experiment an eighth subculture of virus was used. Chloroformed sand filtrate was prepared as before and chickens inoculated as shown in Chart 13.

CHART 13

CHICK	INOCULUM	DAY			
		7 TH	14 TH	21 ST	28 TH
160	1 cc SAND FILTRATE.	—	—	—	—
169	1 cc 8 TH SUBCULTURE.	—	—	—	—
170	0.5 cc SAND FILTRATE + 0.5 cc 8 TH SUBCULT.	●	●	●	† 28 TH DAY.

MAMMALIAN TUMOURS.

Four standard tumours of rats and mice have been studied. These are: (1) A spindle-celled sarcoma of the mouse, strain 37/S of the Imperial Cancer Research Fund; (2) the Jensen rat sarcoma; (3) a carcinoma of the mouse, strain 63; and (4) a rat carcinoma, strain 9, both of the Imperial Cancer Research Fund. The mouse tumours 37/S and 63 give 100 per cent. of takes in mice, metastasise, and always kill the host. The rat tumours often retrogress. All four tumours are accepted as genuine neoplasms by competent pathologists in this country and abroad.

The first part of the investigation was a re-examination of the filterability of the sarcomata. In this work, during the early months of 1924, I enjoyed the assistance of my colleague Dr. W. J. Purdy. The mouse tumour 37/S, especially, was thoroughly tested. The method of preparing extracts was similar to that described for the chicken tumour. The candle used was a Chamberland L₁, which permits *B. prodigiosus* to pass when a rich broth culture is filtered; cells, however, are invariably kept back. In different experiments the tumour tissue was ground with sand at freezing-point, at room temperature, and at 37° C. The diluent was varied from time to time; the pH was varied from extreme acidity to extreme alkalinity. But under no conditions were we able to produce a tumour with a cell-free filtrate. It may be taken as certain that the mouse sarcoma 37/S is not a filterable tumour in the sense that the Rous chicken sarcoma is. The same may be said of the Jensen rat sarcoma, though fewer experiments were made with this tumour. The carcinomata were not reinvestigated.

Mouse Sarcoma 37/S.

The survival of the tumour cells in vitro was first tested. This was repetition of unpublished work which I had first carried out in 1918-19 whilst on the staff of the Imperial Cancer Research Fund. The general result of these studies is that the tumour cells die relatively rapidly when incubated at 37° C. in Ringer's fluid or broth. This is illustrated by a typical experiment.

Several tumours were excised aseptically and minced with sharp scissors; 1 c.cm. of the mince was then delivered by means of a syringe into 5 c.cm. of Ringer contained in a test-tube. Another portion of the mince, contained in a sterile capsule, was kept in the cold. The tube of Ringer containing tumour cells was now placed in a beaker of water the temperature of which was 37° C. and kept at this temperature for 18 hours. Two series of 12 mice were now inoculated, one with the incubated tumour cells which had been separated from the Ringer by spinning; the second set with the tumour emulsion which had been kept in a sterile capsule in the cold. The second set of mice developed tumours in the usual way, whilst those injected with incubated cells remained exempt and were eventually killed.

The explanation of the early death of cells is certainly not simple. The addition of serum tends to preserve the viability of cells, as does also an abundant supply of oxygen. Absence of oxygen—for incubation

in Ringer is partial anaerobiosis—plays an important part in the lethal process. When a piece—about a gramme—of healthy tumour is dropped into a tube of rabbit serum KCl broth and the tube is incubated 24 hours in an anaerobic tin and the clear supernatant fluid then injected into mice, about 50 per cent. of the animals develop tumours which appear usually on the fourteenth to eighteenth day and attain a large size—2–3 g.—in four to five weeks. The tumours thus produced have the structure characteristic of 37/S, and behave identically when transplanted in other mice. Are they produced by inoculation of an occasional cell which survives anaerobic incubation? Or are they genuine new growths produced by infecting the host's own cells with a virus derived from the incubated tumour tissue? It is probable from what has already been said that the second explanation of their origin is the correct one. The following experiments prove this.

A number of healthy tumours were removed and placed—about 2 g. per tube—in tubes of rabbit serum KCl broth. The tubes were now put into a McIntosh and Fildes anaerobic jar which was evacuated with a Geryk pump. As the pressure in the jar fell gases bubbled out of the tubes and especially from the surface of the tumour tissue. Pumping was continued till no more gas was given off. Hydrogen was then run into the jar and the coil of platinised asbestos warmed with an electric current in order to achieve complete anaerobiosis. The jar was incubated at 37° C. for three hours and was then again evacuated. This time the medium in the tubes, being warm, boiled under the reduced pressure. In this way the air entangled on the tumour was completely removed. The jar was made anaerobic and then incubated for 24 hours at 37° C. The jar was now opened, the fluid in the tubes pipetted off, spun in the centrifuge, and the topmost layers of fluid taken off and inoculated into mice. The mice had well-developed tumours in 14 days, which were removed in 21 days and the experiment repeated with them. The same result was again obtained. Thus by incubating under perfectly anaerobic conditions the percentage of tumours obtained may reach 100. The following is the protocol and chart of the second experiment.

Experiment April 30th, 1925.—About 1 g. of healthy tumour tissue was placed in a tube of rabbit serum KCl broth; incubated 25 hours anaerobically in a jar. On May 1st

CHART 14

30.4.25		DAY		
MOUSE		7 TH	14 TH	21 ST
1	BLACK & WHITE ♀	—	●	●
2	YELLOW ♀	—	●	●
3	WHITE ♀	—	●	●
4	CHOC. & WHITE ♂	—	—	●

four mice were inoculated, each with 1 c.cm. of supernatant fluid (Chart 14). Lest doubt remain that cells have survived anaerobic incubation and originated tumours, the following experiment was performed.

Experiment May 22nd, 1925.—Cultures were made as before by adding healthy tumour tissue to medium and incubating 24 hours at 35° C. The cultures were now mixed in a boiling tube and one half inoculated into mice (A); the liquid remaining was filtered through a Chamberland L₁ candle. Chart 15 shows the result of the experiment. Primary cultures of 37/S, incubated for three days in this way fail to produce tumours. Proof that this is not due to death of the virus will be given in another paper. Charts 14 and 15 are the best results obtained. When dry necrotic tumours are used the results of inoculation may be quite negative.

It is now certain that a typical mammalian sarcoma (37/S) can be transferred with a cell-free filtrate, under the special conditions described. The Rous chicken tumour is thus, in reality, not exceptional; it differs

from the mammalian sarcoma 37/S merely in the fact that its accessory chemical factor is either more abundant or more stable. All the evidence points to the oxygen lability of the chemical factor and it is possible that the explanation of the uniform failure

CHART 15

MOUSE		7 TH DAY	14 TH DAY	21 ST DAY
A. MICE INOCULATED WITH UNFILTERED CULTURE.				
1	YELLOW ♀	—	●	●
2	FAWN ♀	—	●	●
3	DARK FAWN ♀	—	●	●
4	BLACK & WHITE ♀	—	●	●
B. MICE INOCULATED WITH FILTERED CULTURE.				
1	BROWN ♀	—	●	●
2	BROWN ♀	—	●	●
3	BLACK ♀	—	●	●
4	BLACK & WHITE ♀	—	●	●
5	BLACK & WHITE ♀	—	●	●
6	BROWN & WHITE ♀	—	●	●

to transfer 37/S with tumour filtrates is due partly to the oxidation of the specific factor in grinding with sand, and partly to the excessive dilution necessary to form a filterable mixture.

Jensen's Rat Sarcoma, Rat Carcinoma 9, and Mouse Carcinoma 63.

It will be observed that proof of the existence of an extrinsic cause of 37/S sarcoma proved to be a lengthy and laborious research. For the remaining three tumours an indirect method has been adopted to obtain the same information. The method consists in substituting the virus of one of these tumours for that of the Rous sarcoma in the manner indicated in the following experiments:—

Experiment April 17th, 1925.—Sand filtrate of Rous chicken sarcoma was prepared from healthy tumour tissue. The filtrate was perfectly clear, faint yellow in colour, and viscid. 10 c.cm. were saturated with chloroform and then incubated in a beaker of water kept at 30° C. The chloroform was completely removed by means of a Geryk pump and the following experiment was made:—

Chicken 251 was inoculated with 1 c.cm. of the filtrate; Chicken 252 with 0.5 c.cm. of the filtrate to which was added 0.5 c.cm. of a culture made by adding a fragment of 63 carcinoma to rabbit serum KCl broth and incubating

CHART 16

17.4.25		DAY				
CHICKEN		7 TH	14 TH	21 ST	42 ND	70 TH
251	—	—	—	—	—	—
252	—	●	●	† 21 ST DAY.	—	—
253	—	—	—	—	—	—

anaerobically for three days at a temperature of 36° C.; and Chicken 253 was inoculated with 1 c.cm. of the culture of 63 carcinoma. The result is shown in Chart 16.

It is evident from this experiment, which has been repeated many times, that the culture of 63 carcinoma can replace the virus of the Rous tumour. The tumours thus produced cannot be distinguished histologically or biologically from the Rous tumour.

The next protocol is included to show how important is the preparation of the specific factor.

Experiment May 9th, 1925.—Clear sand filtrate was prepared from a Rous tumour and two lots, each of 10 c.cm., were taken. To one a few drops of chloroform, insufficient to saturate the mass, were added and the mixture incubated for three hours; to the second lot of 10 c.cm. rather more than 1 c.cm. of chloroform was added and saturation facilitated by repeated mixing. The second tube was incubated for 5 hours. Chickens were inoculated as follows:—

(a) Chicken 284 was injected with 1 c.cm. sand filtrate insufficiently treated with chloroform; Chicken 285 with 0.5 c.cm. to which was added 0.5 c.cm. of a three-day primary culture of carcinoma 63; and finally, Chicken 286 was inoculated with 0.5 c.cm. of filtrate diluted to 1 c.cm. with 0.5 c.cm. saline. The result is indicated on Chart 17.

CHART 17.

CHICK	DAY			POST MORTEM
	7 TH	14 TH	21 ST	
284	—	—	●	KILLED 23RD DAY. SMALL TUMOUR. NO METASTASES.
285	—	●	●	DIED 22ND DAY. LARGE TUMOUR. DEPOSITS IN LUNGS AND LIVER.
286	—	—	—	KILLED 42ND DAY. NO TUMOUR.

(b) Experiment with sand filtrate treated with excess of chloroform and incubated five hours. Details are shown on Chart 18.

CHART 18

CHICK	INOCULUM	DAY		
		7 TH	21 ST	42 ND
287	1 cc FILTRATE.	—	—	—
288	0.5 cc FILTRATE + 0.5 cc CULTURE OF MOUSE CARCINOMA 63.	—	—	—
289	0.5 cc FILTRATE + 0.5 cc CULTURE OF RAT CARCINOMA 9.	—	—	—

Rat Carcinoma 9 and Jensen's Rat Sarcoma.

These tumours will be taken together in order to save space. Cultures of them are made in the usual manner by adding a fragment of healthy tumour to a tube of rabbit serum KCl broth. Carcinoma 9 usually becomes very hæmorrhagic and a young tumour must therefore be taken. In the case of the Jensen rat sarcoma retrogression is so common that it is advisable to chart the tumour frequently in order to be certain that it is taken in the growing phase. Such cultures may now be substituted for the Rous cultures, as in the experiments already taken from protocols for tumour 63.

Experiment May 15th, 1925.—10 c.cm. of water-clear sand filtrate of a Rous tumour was taken and treated with chloroform. The following chickens were inoculated: Chicken 291 with 1.5 c.cm. treated sand filtrate (specific factor), Chicken 292 with 0.5 c.cm. filtrate plus 0.5 c.cm. saline, Chicken 293 with 0.5 c.cm. filtrate plus 0.5 c.cm. of a twelfth subculture of the Rous tumour, Chicken 294 with 0.5 c.cm. filtrate plus 0.5 c.cm. of a culture of rat carcinoma 9, and Chicken 295 with 0.5 c.cm. filtrate plus 0.5 c.cm. of a culture of the Jensen rat sarcoma (Chart 19).

Again, the tumours produced with the specific factor of the chicken sarcoma, together with cultures from the rat tumours, do not differ in structure from the ordinary Rous No. 1.

It has now been shown that the non-specific factor can be obtained from three mammalian tumours. Experiments with subcultures of these tumours are not yet complete, but there is no reason to doubt that the element provided is a virus.

HUMAN TUMOURS.

Tests with three tumours only have been completed. One of these, for which I am indebted to Dr. A. G. L. Reade, was a scirrhous carcinoma of the breast. Cultures were made, but proved to be contaminated. Nevertheless, chickens were inoculated with the

culture and specific factor but results were negative. The second was a sarcoma of the thigh, pieces of which were kindly given to me by Sir Cuthbert Wallace. The cultures which were made from this tumour were uncontaminated, but experiments on chickens failed

CHART 19

CHICK	INOCULUM	DAY				P.M.
		7 TH	11 TH	14 TH	21 ST	
291	1.5 cc SPECIFIC FACTOR.	—	—	—	—	K 35TH DAY. NO TUMOUR.
292	0.5 cc SPECIFIC F. + 0.5 cc SALINE.	—	—	—	—	K 35TH DAY. NO TUMOUR.
293	0.5 cc S.F. + 0.5 cc 12TH SUBCULTURE OF ROUS TUMOUR VIRUS.	—	●	●	●	K 24TH DAY.
294	0.5 cc S.F. + 0.5 cc 3RD DAY CULT. OF RAT TUMOUR 9.	—	●	●	† 18TH DAY	
295	0.5 cc S.F. + 0.5 cc CULTURE OF JENSEN RAT SARCOMA.	—	?	●	† 18TH DAY	

completely. The third was an adeno-carcinoma of the breast; I am indebted to Prof. G. E. Gask for the opportunity to test it. Cultures were made both from the tumour itself and from an axillary gland which was enormously enlarged. There was no contamination in the cultures. The experiment was made on May 23rd, 1925. Chart 20 shows the result.

CHART 20

CHICK	INOCULUM	DAY			
		7 TH	14 TH	21 ST	28 TH
296	1 cc SPECIFIC FACTOR OF CHICKEN SARCOMA.	—	—	—	—
297	0.5 cc S.F. + 0.5 cc CULTURE OF HUMAN TUMOUR IN R.S. KCl BROTH, 4 DAYS AT 36°C.	?	●	●	†
298	0.5 cc S.F. + 0.5 cc CULTURE OF GLAND IN R.S. KCl BROTH, 4 DAYS AT 36°C.	—	●	●	†

Chick 297 died on the twenty-third day; and Chick 298 on the twenty-eighth day.

The tumours produced were again indistinguishable from the Rous tumour.

One human tumour then behaves like the rat and mouse tumours. The negative result with the human sarcoma may mean that a group of viruses—not interchangeable—exist which cause tumours, but obviously more experiments must be done before an opinion can be formed. The failure with the scirrhous tumour can be ignored owing to the contamination of the culture.

DISCUSSION.

It has now been shown that the Rous tumour No. 1 is caused by a virus which has been cultivated; that the mouse sarcoma 37/S can be transmitted with cell-free filtrate; that the rat tumours 9 and J.R.S. and the mouse carcinoma 63 and a human breast carcinoma all provide a factor which can replace the virus of the Rous tumour in the genesis of a chicken sarcoma.

The common factor of the last four tumours is almost certainly a virus. The production of tumours with remote subcultures remains to be done. Further, it has now been shown that the virus alone is unable to bring about the malignant transformation of a cell. An adjuvant, fortunately provided in abundance by the chicken sarcoma, is necessary; this adjuvant

I have called the specific factor. Superficially, it might be thought that Bail's term "aggressin" would appear satisfactory, but a casual analysis of the facts relating to an aggressin shows that this is not so. As an example of an aggressin the toxin of *B. welchii* will be taken. The toxin is separated from the bacilli by filtration and the minimal lethal dose for mice determined. Bacilli, conveniently grown on solid medium are washed free of toxin, and are then found to be perfectly harmless to mice. If, now, mice are inoculated with a sublethal dose of toxin to which has been added washed *B. welchii*, an infection is set up, more toxin is produced in vivo, and the mouse eventually dies of a spreading gangrene with toxæmia. When the bacilli added to the toxin are *B. welchii* the infection produced is characteristic of *B. welchii* infections; when *Vibrio septique* is added the disease produced is characteristic of *Vibrio septique*; and similarly, toxin-free harmless tetanus spores mixed with sublethal doses of *B. welchii* toxin produce tetanus.⁸ Thus, the specificity in these cases depends upon the microbes; the aggressin, acting equally well for all three, produces a microscopic lesion which in some way, not yet fully understood, enables these anaerobic organisms, which alone are harmless saprophytes, to proliferate in the tissues and there to make their characteristic poisons. These facts have been established by experiments similar to, but much easier to perform than, those which have been employed in the work described in this paper. The differences between an aggressin and the specific factor of a tumour are evident.

These researches have led me to look upon cancer—using the term in its widest sense—as a specific disease caused by a virus (or group of viruses). Under experimental conditions the virus alone is ineffective; a second specific factor, obtained from tumour extracts, ruptures the cell defences and enables the virus to infect. Under natural conditions continued "irritation" of tissues sets up a state under which infection can occur. The connexion between the specific factor of a tumour and an irritant remains to be investigated. Some of the relatively unimportant "irritants" are known, such as coal-tar, paraffin oils, &c. The virus probably lives and multiplies in the cell and provokes the cell to continued multiplication.

The methods of experiment now described, and the obvious extensions of them, give the means of classifying the viruses, of investigating the nature of the specific factor, and of testing suspected "irritants," such as preservatives in foods, which may play a rôle in the genesis of a tumour.

I am indebted to the Executive Committee of the Imperial Cancer Research Fund for placing at my disposal their unrivalled series of animal tumours. My thanks are due to my former chief, Dr. J. A. Murray, F.R.S., for his continued critical interest in the work. To my colleague, Dr. W. J. Purdy, I am indebted for assistance in many experiments, for help in the routine inoculation of tumours, and for the preparation of charts; over and above this direct help, I desire to acknowledge the advantages I have derived from his criticisms both of experiments and the interpretations placed upon results. Finally, I wish to state that I owe much to my laboratory servant, Mr. W. Hall, for his willing service.

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THE MICROSCOPICAL EXAMINATION OF FILTERABLE VIRUSES

ASSOCIATED WITH MALIGNANT NEW GROWTHS.

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(With Illustrative Plates.)

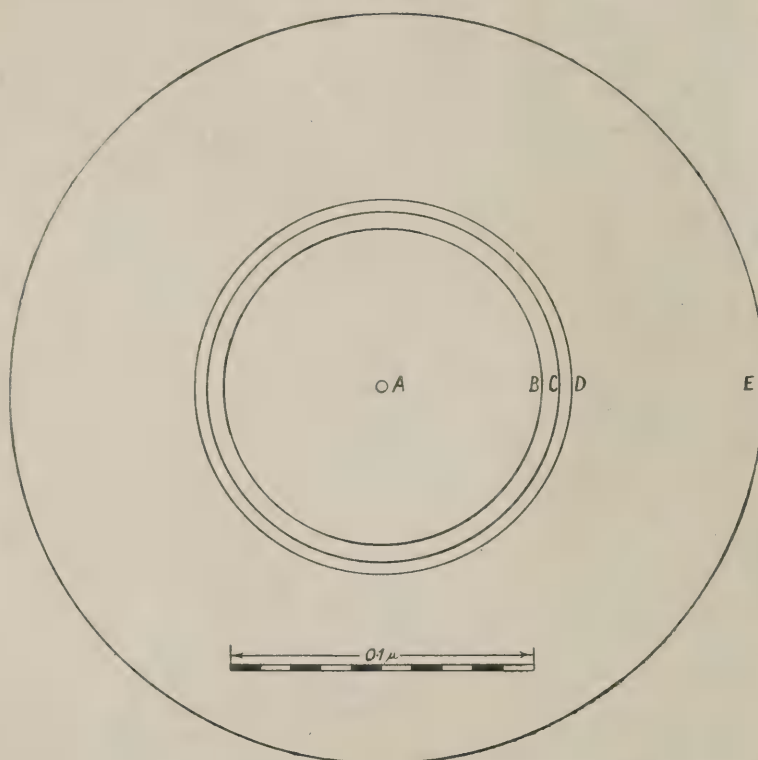
Introduction.

THE search for filterable viruses by microscopical methods presents problems of great difficulty, due for the most part to the optical limitations of the microscope. The evidence that such organisms exist is based upon numerous experiments in which infective material has retained its infectivity after passing through a filter that will not pass the smallest known visible organism. There is at present no method in general use by which such filters can be standardised, and it is therefore not certain that filterable viruses can be regarded as organisms of any definite order of size. Other factors than size of the organism influence the result of filtration experiments, not the least being variability of the filters themselves and the viscosity of the filterable material. If filtration did give more exact information as to the size of any given organism it would then perhaps be advisable to adopt some other standard of reference than permeability. Such a standard might be the limits of microscopical resolution, by which all bodies of less than 0.25μ in their greatest diameter should be regarded as filter-passers, although in that case some other more suitable name might well be found.

It is necessary to consider the main factors limiting both visibility and resolution in the microscope as these limits operate so definitely in any attempts to see or to photograph small bodies. It is also of interest to realise the probable size of filterable viruses in relation to the smallest micro-organism on one hand, and a large molecule on the other. The latter limits are shown diagrammatically in Figs. 1 and 2. The inner circle A in Fig. 1 may be regarded as a hæmoglobin molecule, molecular weight 16,600 approximately. The circles B, C, D, represent the orders of microscopical resolution obtainable if certain ultra-violet radiations are used of wave-lengths 232μ , 257μ , and 275μ respectively; they do not indicate the magnitude of relative wave-lengths. The circle E represents the relative position of the green line in mercury wave-length 546μ , with which the visual observations have been made. Between the positions A and B, therefore, no method at present exists by which microscopical resolution can be obtained. (The millimicron $\mu\mu$ = one-thousandth of a micron, 10^{-7} cm.) It is convenient to use the micron for microscopic dimensions and the millimicron for wave-length estimations. To enable a comparison to be made with an organism of known size, reference must be made to Fig. 2, which is on one-tenth the scale of Fig. 1. In this the relative wave-lengths are represented by the small inner circles B, C, D, and E, and the outer circle F represents a body of 1.0μ in diameter, the average size of a small micrococcus. On reference again to Fig. 1 it will be seen that to obtain the necessary microscopical resolution, a term which will be explained later, and which is proportional to the wave frequency of the light used, it is necessary to use light of wave-length $275 \mu\mu$ if a body of 0.1μ in diameter is to be represented, whereas wave-length $257 \mu\mu$ would resolve down to approximately 0.075μ , a dimension that is of importance in the present investigation. Fig. 2 gives some idea of the possible sizes of filter-passers. It is certain that they are made up of a considerable number of complex molecules, but no exact limit is assignable in either direction. There are, however, two physical considerations that do suggest a limit of smallness. One is the difficulty here would be for a small body to overcome its

relatively great surface tension and to divide and reproduce itself by binary fission as larger organisms do; the other is the mean free path, or Brownian motion, which it would acquire if it exists as a separate particle. There are reasons to think that these conditions are provided against in the life processes of small organisms, and the evidence that this is so will be detailed later; at the same time these factors must and do operate at times, and they may therefore be regarded as limiting factors in any estimation of size. There are other circumstances that cannot be detailed here suggesting that filterable viruses are of sizes represented by the distance between B and D,

FIG. 1.



Diagrams to show relative magnitudes.

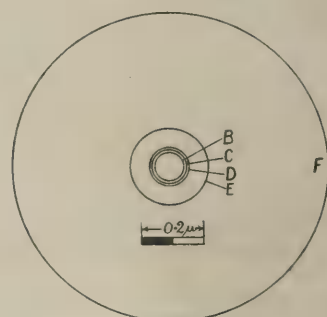
and can therefore be photographed by ultra-violet light of the wave-lengths indicated. No objective has yet been constructed which works to or near the theoretical limit that the shortest of these wave-lengths should give, but experimental efforts indicate that such will be evolved in due course.

The Microscopical Limits of Observation.

Microscopic objects may be divided into two classes, those that are seen by transmitted light and those that can be made self-luminous. The former are seen as the result of partial or of selective light absorption, that is, they may be semi-opaque, the elements of structure absorbing more or less light, or they may be seen in colour as the result of selective absorption as in a stained preparation. For an object to be self-luminous, it must be illuminated in such a manner that no direct light reaches the micro-objective but only that which is refracted, diffracted, or scattered by the object itself. Under these conditions an object is seen as a bright image on a dark background and the method is known as dark-ground illumination. The main purpose in all microscopical observations is to obtain the greatest resolution, and the term, "limits of resolution," is applied to that state of affairs in which no further separation of elements of structure is obtainable. Only late in the last century was it definitely recognised that there

are theoretical limits beyond which the microscope as ordinarily employed cannot go, and these theoretical limits are now all but reached under proper conditions of use. If two points in an object are within a certain limiting distance of one another they cannot be separated by any known means. Further, if an isolated element of structure is smaller than a certain limit the image seen does not represent its exact form or size. Magnification as such does not help, as, however much the image may be enlarged, there is no resulting increase of resolution. The main factors governing resolution are the numerical aperture of the objective used and the wave-length of the light employed. The best results are therefore to be expected when numerical aperture (N.A.) is large and the light used of the shortest wave-length practicable. While this power of delineating fine detail is of primary importance in all observation, another factor comes in with self-luminous objects which is hardly less important, and that is visibility. The term "ultra-microscope" is often inaccurately applied to all illuminating appliances that render an object self-luminous, but it should in fact only be used to describe apparatus which renders particles visible that are smaller in all dimensions than the resolu-

FIG. 2.



tion limits. In actual practice this limit is reached with isolated objects or elements of structure that are less than 0.25 micron in diameter. When objects larger in any dimension than this limit are being so observed the method may be described as "dark-ground" illumination, whereas, when the objects are smaller, "ultra-microscopy" is the correct term. Neither dark-ground illumination nor the ultra-microscope can be regarded as a means of increasing resolution, their main purpose being to obtain greater visibility, although the full resolving power of any given lens may be secured by this means. In the light of recent experiments it is, in fact, clear that full resolving power is obtained more certainly by an efficient dark-ground illumination method than by any other means. In theory there is no limit to the smallness of an object that can be made visible if a sufficiently powerful illuminant is used. In practice, however, the dark-ground illumination limits are governed by the following conditions:—

- (1) That the particles under observation can themselves scatter enough light to enable them to be seen.
- (2) That the particles are separated from one another by intervals that are within the limits of resolution of the microscope objective used.
- (3) That there is sufficient difference of refractive index between the particles and the medium in which

they are immersed. Only under certain very limited conditions can the full resolving power of the best oil-immersion objectives available for visual work (those in which $N.A. = 1.4$) be secured by this means. The limits in biological work are, less than this, and are imposed by the refractive index of the medium in which the objects to be examined are immersed. As these are rarely widely different from water (with a refractive index of 1.33) it follows that the $N.A.$ of any objective used could not exceed about 1.27. In practice the use of even this $N.A.$ introduces difficulties when there is but a small difference of refractive index between object and medium. The method that appears to be most satisfactory, therefore, is to use an illuminator with such an illuminating angle that it admits of the use of an objective of 1.20 $N.A.$ for all preliminary and routine observations. The highest practicable $N.A.$ 1.27 is reserved for use in cases where circumstances are favourable, a point that can only be determined by experience. The highest practicable resolution, therefore, by dark-ground methods is that which enables an object of the order of 0.35μ to be seen and perfectly resolved, although much smaller bodies may be rendered visible and some of their physical properties determined. The limits of dark-ground methods in the search for filterable viruses are therefore obvious, but it has been found in practice that much preliminary work can be done. The only other method likely to be of service is, therefore, to use light of a short wave-length as indicated already. Approximately a body may be photographed of one-half the size of the wave-length used. The simple formula governing resolution is given by the relation, $a = \frac{1}{2} \lambda / \sin \alpha$, where λ is the wave-length of the light employed when passing through the medium used, and α is the angle emitted by half the diameter of the back lens of the objective. Thus the value of d , which is the limiting distance between two particles, or the size of a single particle if a correct image is to be seen, can be reduced by increasing aperture or decreasing the wave-length of light used as an illuminant. The former factor is determined by the objective and for visual work cannot be increased. The latter can in theory be altered to any extent, and the usual expression for attainable resolution

$$\frac{\lambda n}{2\mu \sin \alpha}$$

can be diminished so that a filterable virus of any probable size should be resolvable. This is at least what theory indicates, and the direction of experimental work in the department of applied optics is to make such radiations available as are needed for any particular purpose. The present position is not discouraging, but it is admitted that many practical difficulties have yet to be overcome.

It follows, therefore, that there are at present only two methods of attack if a microscopical image of a filterable virus is to be obtained:—

1. The observation of the living material by dark-ground illumination methods in which visibility would be secured in terms of the size of the particular virus.

2. The use of light of short wave-length (that is by means of invisible radiations) resulting in higher resolution, proportionate to the wave frequency.

Both of these methods exclude any process such as staining, in which changes will certainly occur owing to the preparation or fixing of the material. Gye has already referred to the difficulties he experienced in endeavouring to demonstrate organisms in infective material. It is evident that in cases where the body to be observed is below the limits of microscopical resolution, any staining method would be useless. Even more, such processes would destroy the only recognisable characteristic that such bodies possess, the difference that there might be in physical, and particularly in optical qualities, between them and inert particulate matter. In the dark-ground arrangement this would be evident mainly in terms of visibility, but by the use of ultra-violet light it is possible to obtain a real image of a small body providing a short enough wave-length is used.

Dark-ground Illumination Methods.

The apparatus used for this method may now be briefly described. The source of light is a quartz mercury-vapour lamp of the non-vacuum type as designed for microscopy. Colour screens are used to give either monochromatic blue, green, or yellow. The green line in mercury is peculiarly suitable as it is a narrow one and so approaches closely to a true monochromatic light source. Further, as this line is in that part of the spectrum to which the eye is most sensitive it is possible to work with light of low intensity, a point of the utmost importance in dark-ground work.

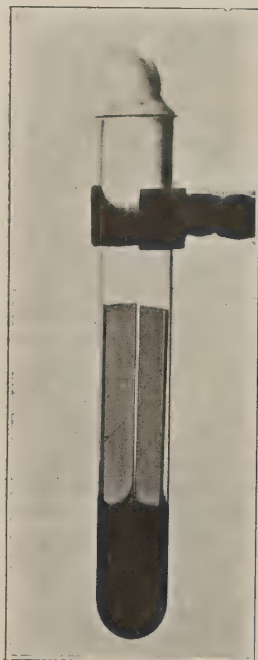
It is commonly stated, even in text-books, that a powerful light source is necessary, but this only results in such irradiation from larger particles that all fine detail is lost. A stable, well-made microscope is essential as all adjustments must be made with the utmost care. Thus, perfect centration of every part must be secured and the slide and cover-glass must be truly normal to the optical axis of the microscope. Full instructions for setting up a dark-ground illuminator will be found in the Special Report Series No. 19 issued by the Medical Research Council. The illuminators used have been designed to work with 2 mm. apochromatic objectives of 1.2 $N.A.$ and 1.27 $N.A.$, and the whole outfit is made by Messrs. R. and J. Beck, Ltd. Both these condensers work at their best with slides of the thickness of a No. 2 cover-glass. The material to be examined is therefore mounted between two cover-glasses and these are held in a chamber designed for the purpose. Provision is made to ensure that the layer under examination is as thin as possible, regard being paid to the necessity of preventing undue compression. A semi-darkened room is essential for this work, and the illuminant must be so shielded that no direct light reaches the eye at any time. Another essential is to provide means for reducing the light intensity without altering its quality. This is best secured by using semi-platinised glass screens prepared by the method described in the writer's book on photomicrography. A high-power compensating ocular $\times 18$ to $\times 25$ is necessary for final observations and the objectives mentioned will tolerate these perfectly.

The Microscope for Ultra-violet Photography.

The mechanical part of the microscope used is of special construction, as no ordinary one would fulfil the required conditions. Its essential features are great stability and high accuracy of all movements, and its general design is seen in Plate I., Fig. 1. Both the coarse and fine adjustment A_1 and A_2 are actuated through a large accurately-cut screw of the type usually employed on an interferometer, the bed being a heavy casting of girder type supporting the whole. The objective and ocular are carried on separate carriers O_1 and O_2 , with no body-tube between them as in an ordinary microscope. This ensures that the adjustment of either optical part does not disturb the other. The mechanical stage is strongly supported so that it is truly at right angles to the optical axis. The two milled heads A_4 control the movements of the object on the stage within certain limits, but the quartz slide is held in a novel manner to give some freedom of movement by hand, while ensuring that the slide is always kept in close contact with the stage, a matter of moment in ultra-violet work. The combined dark-ground and ultra-violet light illuminator O_3 , described later, is supported on a strong centring sub-stage, which is moved by an accurate screw controlled by the large graduated head A_3 . This is, in fact, a divided circle enabling the dark-ground or the ultra-violet light illuminating apparatus to be accurately focussed in any wave-length. The mercury-vapour lamp M_1 is mounted on a subsidiary optical bench which is arranged at right angles to the axis of the microscope. At M_2 a reflecting prism is mounted which can be swung into line, thus enabling the beam of light from the mercury-vapour lamp to be projected into the

microscope. When the prism is swung out of line ultra-violet light from the spark-gap S_1 is projected by the quartz lens S_2 through the quartz prism S_3 , and so into the central part of the microscope condenser. The arrangement therefore admits of either illuminant being brought into use by simply deflecting the prism M_3 . This description is of necessity superficial, and assumes some knowledge of the orthodox methods of ultra-violet light microscopy, a full description of which by the writer can be found in the "Dictionary of Applied Physics." One of the main differences in principle here introduced is that focussing in any wave-length desired is performed in reference to the dark-ground image seen in the green line in mercury wave-length $546 \mu\mu$. Focussing by means of the fluorescent image is both difficult and dangerous owing to the action of ultra-violet light on living organism. Changes can be set up which might be regarded as normal appearances in the organism. The actual exposure, therefore, of any material to ultra-violet must be the shortest possible. There is no reason to regard the action on living organisms as a trigger action, a certain time factor is involved, but precautions must be observed to ensure that

FIG. 3.

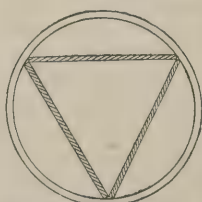


Culture tube showing the disposition of glass slips.

the composite one indicated, and consists of the use of a high aperture dark-ground illuminator already described, mounted concentrically with and encircling

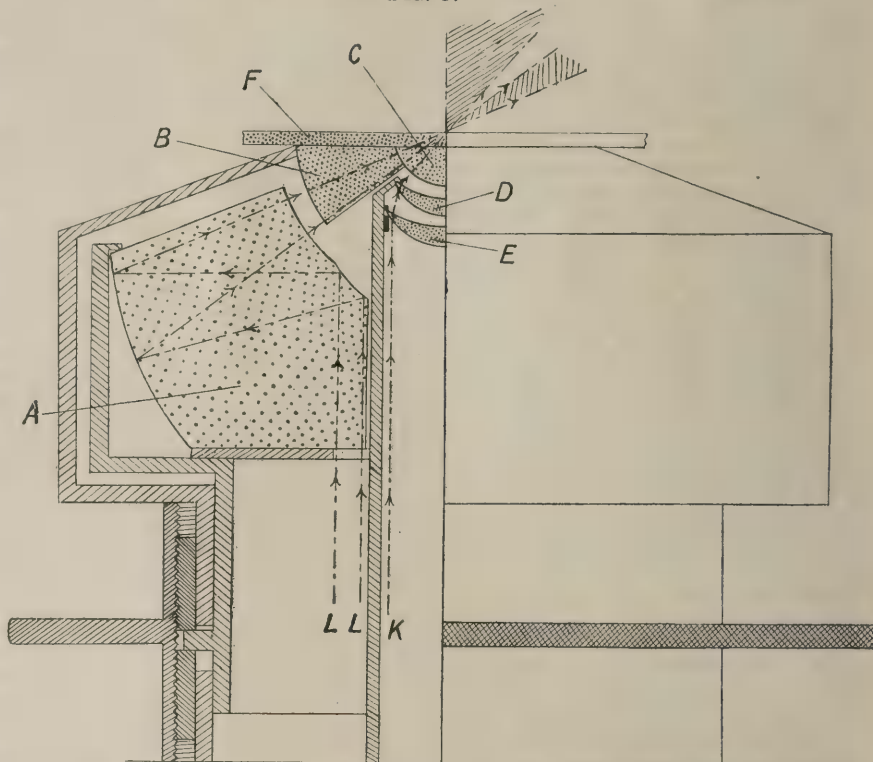
no change due to the light itself is set up. A long series of investigations on the action of ultra-violet on bacteria has been carried out so that this part of the subject is understood; an account of these experiments will be published in due course. There is no reason to regard the filterable viruses that have been under observation as more sensitive to ultra-violet light than ordinary bacteria; there is, in fact, some evidence that they are less sensitive, but this point again requires further investigation. The actual microscopical method employed has therefore been

FIG. 4.



a quartz condenser. The former secures visibility and is used for purposes of search and location; the latter is available for use with any suitable ultra-

FIG. 5.



Combined illuminator in section.

violet radiation and enables a transmitted light image to be secured on the photographic plate. The problem of the best quartz objective to use is still only partly solved; much remains to be done to ensure that the best results should be obtained in any given wave-length. In collaboration with my colleague, Mr. John Smiles, this part of the work is being attacked with every evidence that success will follow. One photograph is shown in which light of $257 \mu\mu$ wave-length is used, and this is certainly the shortest wave-length recorded as having been so applied to microscopy.

Methods of Cultivation.

Cultural methods have been devised and carried out by Gye and are described by him in the foregoing paper. It was, however, found necessary to design some arrangement by which it could be determined whether colonies were developing, and to examine these colonies in situ. From the nature of the growth obtained in fluid there was some reason to doubt whether it would be possible to obtain growth on solid media. Further, as the quantity of growth in fluid, in relation to the volume of medium, is not so prolific as with ordinary organisms, it was regarded as probable that any colonies obtained would be few in number and small in size. A means of examining the surface of serum-agar was therefore desirable in which a 2 mm. oil-immersion objective could be used. Thus it was really necessary to apply to the medium for the detection of colonies a means that would ordinarily be used for the detection of organisms. Briefly, the arrangement that has been found successful is seen in Figs. 3 and 4. An ordinary test-tube is taken, preferably of rather large size, and into it three thin glass slips are introduced in the configuration seen in Fig. 3.

These three slips form a triangle in plan, Fig. 4, and are of such a width that they are free to move in the direction of the length of the tube but cannot

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PLATE I.

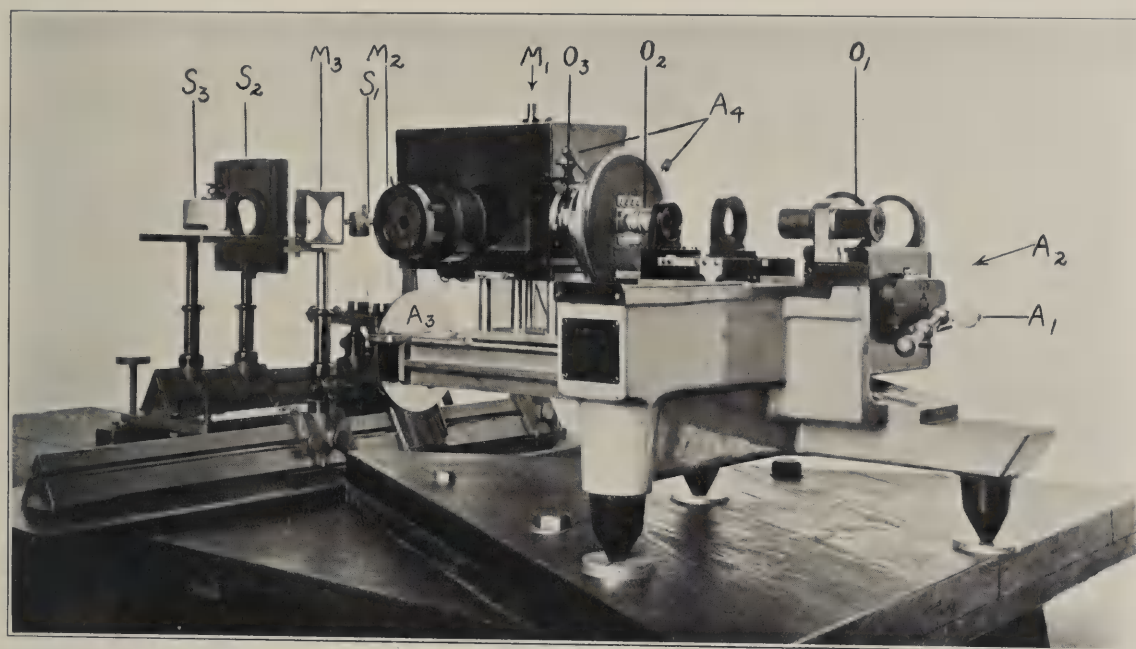


FIG. 1.

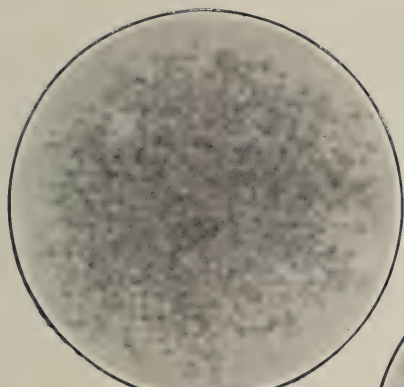


FIG. 2.

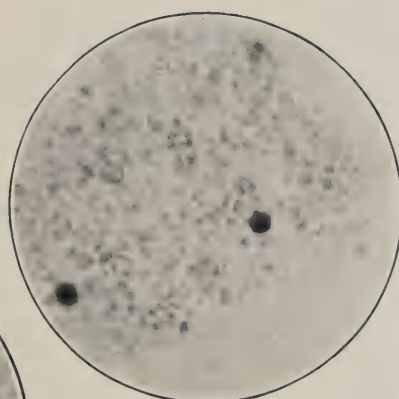


FIG. 3.

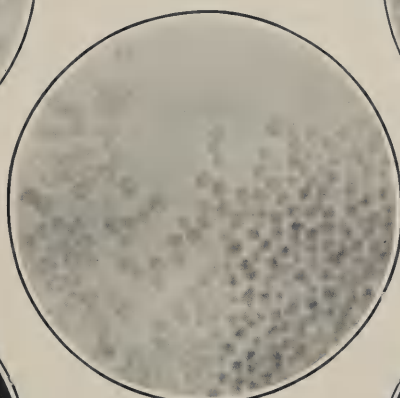


FIG. 6.

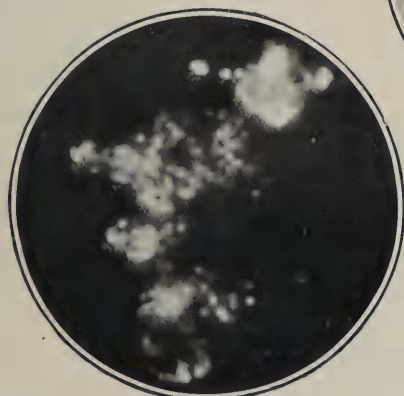


FIG. 4.

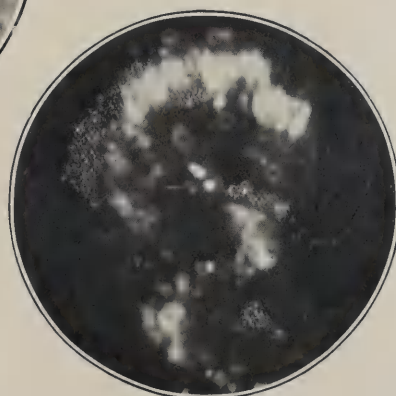


FIG. 5.

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PLATE II.

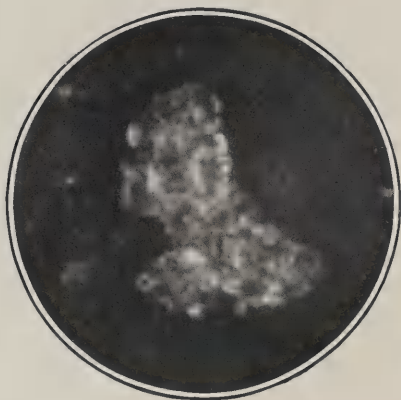


FIG. 1.

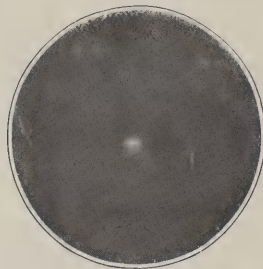


FIG. 2.

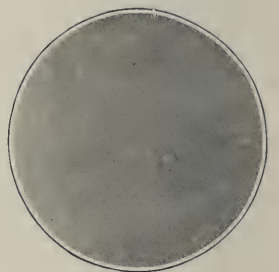


FIG. 3.



FIG. 4.

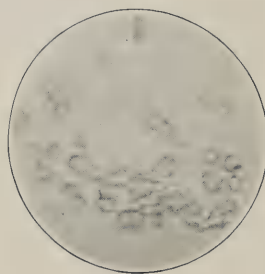


FIG. 5.

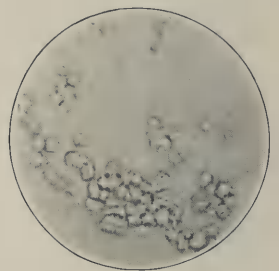


FIG. 6.



FIG. 7.

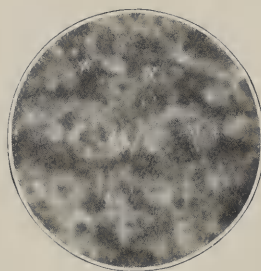


FIG. 8.

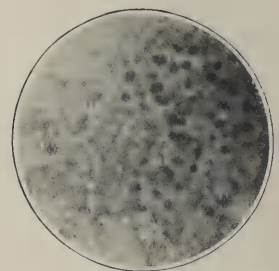


FIG. 9.

move in any other way. They dip into the agar medium seen at the bottom of the tube, and when the agar solidifies are quite stable. The agar is melted, the serum added in the ordinary way and inoculated with the infective material. After inoculation and before solidification the tube is tilted so that the agar runs along the tube and touches the external face of each slip of glass in turn. The amount of agar left on the glass is determined by the temperature, but it is always possible to repeat the tilting process, several times if necessary, until enough medium remains. The tube containing the three slips is incubated and at any suitable period one slip is removed for examination, the remainder going on for a longer period if desired. Either glass or quartz slips may be used so that examination is possible by the dark-ground method or photographs can be taken in ultra-violet light.

In either case a cover-slip of glass or of quartz is placed on the slide so that cedar-wood oil or glycerine may be used as an immersion medium. The serum-agar usually has sufficient surface moisture to secure optical contact between cover-glass and agar layer. It is doubtful whether colonies would have been detected without this method, and a fuller description will be published later by Mr. F. Welch, who has taken so large a part in working out the details.

Description of Combined Illuminator.

The design of this double purpose illuminator is seen in Fig. 5. The front lens of the central quartz condenser is seen at C, the other two lenses of this combination are D and E. The front lens is in glycerine immersion contact with the quartz slide F, on which the object is supported. The outer quartz ring B is part of the dark-ground illumination appliance and is mounted as shown to transmit the dark-ground beam without alteration of direction on striking the quartz lens C. It will be appreciated that this lens C is an essential part of both systems (in the drawing the closely dotted parts are of quartz, while the wider dotting indicates glass). The ultra-violet light therefore passes through the quartz system in the direction K, as shown, and is focused at the point of observation. The dark-ground illumination, portion A, is an annular glass reflector substantially as shown, which transmits its illuminating beam of visible light also on to the point of observation. By sliding a central stop into the apparatus the quartz system is obscured, while the outer dark-ground portion is covered at will by an annular stop. It follows, therefore, that either part may be used by simply inserting the suitable stop. The light energy required for ultra-violet work is supplied by a high-tension alternating spark between suitable metallic electrodes. The electrodes are selected to give any required wave-length, and a fuller description of this will be found in the author's book on Photo-micrography, now in the press. The method of focussing the image in ultra-violet work has hitherto been by means of a fluorescent screen. The image formed by the quartz ocular is thrown on to such a screen, and is then observed by a short-focus telescope. Focussing by this means is always difficult and sometimes impossible, if the object is a translucent one; further, it entails considerable exposure of the object to ultra-violet light. To minimise the difficulty small mercury droplets may be deposited by sublimation on the quartz slide before the material under observation is mounted. Such droplets can be deposited in almost any order of size by variation of temperature of the mercury and time taken for its deposition. Some droplets are seen as dark discs in Plate I., Fig. 3, and this method has proved of value. The combined illuminator has in most cases, however, rendered their use unnecessary, as visibility can usually be secured sufficiently to focus an image in monochromatic green light, and with the accurate microscope described the focussing in ultra-violet becomes a purely mechanical process.

Observations.

The microscopical search for any filterable virus had been prepared for in part by a continual effort to improve the mechanical and optical parts of the microscope, and some definite advances had been made before any material was available. During the war some experimental work on trench fever suggested that something might be done by studying the optical characteristics of infective material. Further, a considerable amount of work had been done with bovine pleuro-pneumonia, as this appears to be the smallest organism known to grow under ordinary bacteriological methods of cultivation. There was, however, no cultural material available of an undoubted filter-passer until the successful cultivation of the Rous fowl sarcoma by Gye. The earliest efforts to observe this organism were of the simplest character, and consisted of the careful observation of uninoculated culture-media side by side with observation of inoculated tubes of subsequently proved infectivity. Dark-ground illumination as described already was employed, and to ensure that the comparison should be exact two microscopes of similar design and with the same optical equipment were set up. Thus infective and non-infective material could be examined and compared under identical conditions, an arrangement that has proved of great value. All the conditions described herein as being essential for accurate observation were carefully observed. Further, as a control, cultures of pleuro-pneumonia were kept going similarly, and observations were made on this organism in the same way. Any tube of infective material that contained bodies not to be seen in a similar uninoculated tube was then examined under the combined microscope, and if practicable an ultra-violet photograph obtained. Thus a dark-ground visual image was observed and ultra-violet photograph obtained that under favourable conditions would give an image of an isolated element of structure down to an order of size of 0.075μ . The observations on pleuro-pneumonia were all carried out on living material, and not in reference to stained preparations. These are still being carried on by my colleague Mr. John Smiles at this institute, and will be described fully by him in due course. Briefly, however, these observations lead to some tentative conclusions. Thus the pleuro-pneumonia organism is a small particulate body about 0.2μ diameter which can only grow and reproduce itself under certain conditions. The particulate form is accompanied by and is dependent for its reproduction on a larger spheroidal body which develops from the particulate form and which then forms the host on which the particulate form can develop further.

Fig. 6 shows diagrammatically the sequence of events as we understand them at present. After about 20 hours a tube that has been inoculated from an agar surface colony will show a number of spheroids that may be represented as No. 1. A few hours later a small refractile dot is seen on one part of the spheroid as No. 2, subsequently developing further bodies as in 3-4. Some spheroids appear to have a thickened wall, while others are thin and of low visibility, but recent observations suggest that this apparent thickening is due to a number of particulate bodies below the limits of size that can be visually resolved. The attached particle then tends to move away from the spheroid, but is still attached to it. This attachment is rarely observed visually, but ultra-violet photographs show it to be a fine filament which is derived from the spheroid and gives to the latter an amoeboid appearance. Some particles soon develop into small spheroids and form groups, as in 16, 17, 18, 19, each of them developing attached particles substantially as shown. In most cases, however, the spheroid tends to disintegrate, or at least become less visible, and finally gets into an unstable physical state, somewhat as shown in 12 and 21, where the central spheroid is still evident but is surrounded by a number of smaller spheroidal bodies. This formation is quite

characteristic, but can only be appreciated when actually seen under the microscope. The grouping and movement in fluid is an interesting physical phenomenon in which a rotating spheroidal body unevenly loaded with particles appears to assume a form suggesting a spiral disposition. That the particles can and do develop into spheroids has been proved by careful filtration experiments. Thus a fluid culture has been filtered by us through a Bechhold collodion membrane of such porosity that it passes the particulate forms but keeps back all visible spheroids. The filtrate was incubated for 12 hours at 37° C. without any evident change, but a fresh tube of serum broth inoculated from it and incubated during the same period show that all the particulate forms had developed into spheroids, and the full life-cycle ensued. The explanation of the life-cycle may, therefore, be that the spheroids take the place of the living cell in providing conditions suitable for reproduction. In very young colonies of pleuro-pneumonia (see Plate I., Fig. 2) the particulate forms do apparently divide for the first few hours only, and are then immersed in some excretory material which reduces their surface-tension. Soon, however, the spheroids develop on the outer edge of the colony, and further reproduction takes place on these in the manner described. The argument is too long for full extension here, but it does appear to be the means by which the difficulty of subdivision by a small body is overcome. It is certain that this organism does not divide in the

but speculation is futile until the exact physical conditions are better understood. A long series of comparative observations on cultures, all of which have ultimately been proved by animal experiments to be infective, has led to the conclusion that the same type of phenomenon, but on a smaller scale, is to be observed in the Rous fowl sarcoma, mouse sarcoma 37/S and latterly in human carcinoma, as can be seen in cultures of pleuro-pneumonia. In no essential point is there any difference, except that the cultures from malignant growths are slower in developing and do not produce such rich cultures. Probably no single factor has hindered the cultivation of filterable viruses so much as the assumption that a culture in broth, for instance, must become opalescent, or that a growth on solid media must develop colonies easily visible to the naked eye. If as we think probable the spheroids are an essential part of the life-history of these organisms then, owing to their low refractive index, they would require to be present in impossibly great numbers to produce evident cloudiness. The fluid cultures from malignant growths always remain clear; on solid media the colonies are so small that they require the use of a high-power objective to see them. The incubation period has not usually exceeded seven days, and examination of the cultures and similarly incubated uninoculated tubes has been made from three days onwards. During that period the same life-cycle has been observed in all cases as that seen in pleuro-pneumonia. Observation is more difficult than with pleuro-pneumonia owing to the small size and lower visibility of the malignant growth viruses. The microscopical technique has, therefore, to be carefully adapted to these more exacting conditions. Unless considerable care is exercised the spheroids may easily be confused with other spherical bodies occurring in most organic fluids. This can only be obviated by a careful preliminary study of uninoculated culture-media.

Description of Plates.

PLATE I.

FIG. 1.—Microscope described in text.

FIG. 2.—Young colony of bovine pleuro-pneumonia photographed in ultra-violet light. $\times 1200$.

FIG. 3.—Edge of an older colony showing spheroids. $\times 1800$.

FIG. 4.—Young colony showing particulate form. Dark-ground illumination. $\times 1850$.

FIG. 5.—Older colony showing development of spheroids. $\times 1850$.

FIG. 6.—The edge of a young colony of *M. pyogenes aureus*, photographed in ultra-violet light to show normal development of an organism. In this case the line of subdivision is seen before the organism changes its external form.

Figs. 2 to 6 are colonies grown on slips by the method described.

PLATE II.

FIG. 1.—Rous fowl sarcoma colony on agar slip. Dark-ground illumination. $\times 1850$. The particulate bodies are seen centrally in small bright masses, the spheroids developing on or near the edge.

FIG. 2.—Rous fowl sarcoma. An isolated spheroid with attached particle. Dark-ground illumination. $\times 1850$.

FIG. 3.—Same as Fig. 2, but photographed in ultra-violet light. The attached particle is seen to be a small spheroid. $\times 2000$.

FIG. 4.—Mouse sarcoma. 37/S. Colony on agar slip. Dark-ground illumination. $\times 1850$. Considerable development of spheroids.

FIG. 5.—A small portion of the colony photographed in ultra-violet light. Wave-length 275μ showing that the spheroids may depart rather considerably from a spherical form at some stages of growth. $\times 2200$.

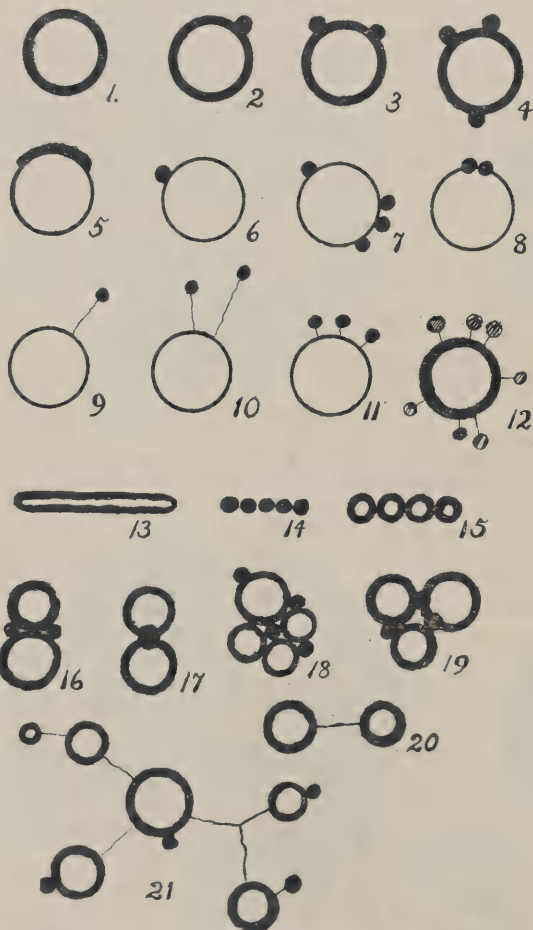
FIG. 6.—Same as Fig. 5, but photographed in ultra-violet light. Wave-length 257μ . $\times 2200$. Showing the ultimate particulate character of the spheroids. From this and other photographs in the same wave-length it is estimated that the particulate form of the virus is of the order of size of 0.075μ . It is certainly appreciably less than 0.1μ , as resolution cannot be obtained with any greater wave-length.

FIG. 7.—Human carcinoma. Colony on agar slip. Dark-ground illumination. $\times 1850$. The same general characteristics are to be seen as in Figs. 1 and 4.

FIG. 8.—A small portion of the edge of a larger colony showing spheroids interspersed with particulate bodies. $\times 1850$.

FIG. 9.—A portion of the edge of the same colony as seen in Fig. 8 photographed in ultra-violet, light wave-length 275μ .

FIG. 6.



Diagrammatic representation of bodies seen in cultures of bovine pleuro-pneumonia.

same way as do ordinary bacteria. The difficulty of growing them artificially, particularly on solid media, suggests that some special conditions are necessary,

The general conclusions to be drawn from the photo-micrographs are that the developmental stages in each of the above are similar. It is feared that the reproduction will not show so well as the original negatives, particularly in those done in ultra-violet light. The difficulties are greatly increased owing to the relative opacity of serum-agar to ultra-violet light, the possibility of obtaining photographs at all being due to the thinness of the layer of culture medium. In addition, the negatives are very thin and lacking in contrast, although they do in the originals show much delicate detail.

NOTE ON THE PRECEDING PAPERS.

BY J. E. BARNARD AND W. E. GYE.

The separate parts of this investigation have now been described, and it remains to indicate how far the results obtained fit together. Our belief that the small bodies seen and photographed are the actual virus depends partly upon the fact that control uninoculated tubes of medium have been invariably blank, and partly upon the correspondence between the microscopical findings and the results of experiments upon animals. This correspondence—allowing for the real difficulties in both parts of the common task—has been so close that, although final proof has not been attained, we are convinced that our conclusions are sound. By final proof we mean the cultivation of the virus from a single colony, or if possible from a single spheroid, and the production of a tumour with the culture thus obtained. This work has been under consideration for a long time, and will be attempted when circumstances permit.

THE

Bowman Lecture

[ABRIDGED]

ON

THE FOUNDATIONS OF VISION.

Delivered before the Convention of English-Speaking Ophthalmological Societies on July 16th, 1925.

BY SIR JOHN HERBERT PARSONS, C.B.E.,
HON. D.SC. (BRISTOL), F.R.C.S. ENG., F.R.S.

[AFTER making introductory reference to Sir William Bowman and his work, the lecturer went on:—]

I propose to delve into the very foundations of the physiology of vision in the hope that a survey of the facts brought to light may elicit some general principles which will clarify our knowledge and point the way to further research.

In so far as the quest is successful its utility will not be limited to vision and to ophthalmology; its repercussions must inevitably be felt in the whole domain of the physiology of the senses and in the psychology which is the conscious expression of that physiology. For our waking life is a continuous cinematographic exhibition, in which varying perceptual patterns succeed each other upon the screen of each individual's experience. Each pattern is, in psychological language, a "presentation," a living picture, in which one feature occupies the focus of attention, surrounded by other more faintly apprehended features which form a relatively indifferent field. It must not be supposed that any such picture is a purely visual presentation, such as we see in a picture gallery. It is a composite picture made up of elements derived from all the so-called senses, and perhaps the object of consciousness is simply to combine and synthesise these diverse factors, in a way which is incomprehensible when viewed simply from the standpoint of the summation of physical

quantities. Yet in man the prepotent factor is generally the visual factor, just as in many lower animals the prepotent factor is that derived from the sense of smell.

INTEGRATION OF PHYSIOLOGICAL IMPULSES.

The integration of these diverse physiological impulses is an active—kinetic—process, and it manifests itself in kinetic consciousness. But there are hierarchies of integration, and when a lower level integration has proved sufficiently serviceable to any given species it becomes part and parcel of the make-up of the individuals of the species. It then generally assumes the characters of potential consciousness, or in common terms is relegated to the "unconscious."

Further, there are many such integrations at every level—and there are many levels, only great groups of levels being collected within the confines of such terms as reflexes, instincts, and so on. Physiologically, the lower levels are, in vertebrates, associated with the activities of the spinal cord and medulla; higher levels with the mid-brain and thalamus; higher still with the palæo- and neo-pallium.

There are comparatively simple integrations and there are integrations of simpler integrations, forming different "patterns" in each level and at each level. And the most important point is that *all these patterns are of biological significance*—they are adaptations in the service of the individual or the species. Hence the most significant features of any pattern are themselves extremely complex. What I mean can be best shown by an example from ontogenesis. In very early days of life a child's attention is attracted by a bright light, and the eyes are moved so that the image of the light is formed on the macula of each eye. A child is soon most attracted towards its mother, and its behaviour towards her differs according to the tone of the mother's voice, her facial expression, and so on. Now, facial expression is a very complex visual presentation, and it is scarcely conceivable that at this very early age the child has succeeded in accurately correlating the innumerable visual impulses into which a facial expression can be analysed. We must rather regard the child's impression as a psychological pattern made up of the integration of a number of relatively undifferentiated auditory, visual, and other complexes, of which the still relatively undifferentiated visual complex forms the focus. It responds to this complex by appropriate behaviour simply because through countless preceding generations its ancestors have responded to similar and even less differentiated complexes.¹ The lower down the animal scale the less differentiated are the complexes to which the individual responds—and his responses are biologically determined—i.e., they are strictly utilitarian. Hence we conclude that the behaviour response is dominated by the psychological pattern, and that higher patterns dominate lower patterns. But, since the lower patterns are more primitive they are the least vulnerable—teleologically because they are concerned with vital processes upon which the survival of individual and species depends. The higher patterns are more highly differentiated and therefore more vulnerable. So that even these complex psychological patterns can be divided into two great groups—one, protopathic and of vital import, and another epicritic and of gnostic import.

PROTOPATHIC AND EPICRITIC SENSIBILITY.

I have adopted the terms protopathic and epicritic from the work of Head and Rivers on the tactile sensibility, feeling assured that the fundamental conception is justified, though I do not agree with all the detailed conclusions arrived at by Head.

Using the terms in the wider sense, we may say that the cognitive element of the crude protopathic response is diffuse, vague, and ill-defined. There is reason to think that the adequate stimulus produces the maximum response at the threshold—the reaction is of the all-or-none variety. The higher differentiation of the cognitive element introduces differentiation of

another nature. The response, while retaining many of the characteristics of the protopathic response, especially as regards its quality, is better defined, susceptible to finer gradation, endowed with more accurate local signature and discrimination, less charged with affective tone, and of greater gnostic significance. This higher differentiation of sensory responses may be termed epicritic in contradistinction to protopathic. It should be noted that it is to be regarded as differentiated and evolved from the protopathic; and just as a highly differentiated cell in the multicellular organism still retains the fundamental characteristics of a living cell in spite of its special differentiation, so each epicritic sense retains the fundamental quality of the protopathic.

The crude protopathic sensibility was essentially utilitarian in the most fundamental sense; upon it depended the survival of the individual and the species. So important is it that it cannot be wholly replaced by the more delicate epicritic mechanism. Hence it is found to persist alongside the epicritic in most of the senses even in the highest animals, though generally modified from its primitive character.

Moreover, the crude primitive protopathic sensibility had to possess that *potential plasticity* which permits of differentiation along many lines. The more highly differentiated epicritic sensibility lost perforce this type of plasticity. Endowed, however, with richer and more sharply defined cognition it was eminently suited to provide a more active, *dynamic plasticity* within a narrower field.

The protopathic phase is seen in its most characteristic form in the lowest vertebrates; the epicritic in the highest. Between the two are many gradations of each which are difficult to unravel; but both anatomical observations and physiological experiments support the view that there is a dual mechanism at work.

[The differentiation of tactile sensibility into protopathic and epicritic was then discussed, and described in various animals.]

THE MOTOR FUNCTIONS OF VISION.

Visual organs of an extremely primitive type occur very low down in the animal scale. At first they consist of a single receptor cell, which like nearly all receptor cells, is generally provided with hair-like processes. Like other receptor sensory cells they are provided with diplosomes, and often fibrils can be shown passing from the diplosomes into a nerve-fibre attached to the proximal end of the cell. Even at this lowly stage the visual cells are almost always situated in direct relationship with one or more pigmented cells, though this is not absolutely essential to the functioning of such cells as visual cells.

It may be considered definitely proved that these cells respond to luminous radiation, and give rise to appropriate motor responses in the organisms in which they occur. Thus the one primitive and indubitable response to the visual impulse is *motor*. What, if any, are the other responses is a matter of conjecture.

The motor response in the lowest forms is a tropism—a movement either towards or away from the light. The organisms certainly respond to wave-lengths which to us are luminous, but we are not justified in concluding that the range of spectrum which is adequate to their visual organs is the same as that adequate to ours. It may be less or more; and further research is needed on this point. Thus, it may well prove that the organs respond not only to wave-lengths which are luminous to us, but also to infra-red and ultra-violet radiations. It is only what might be expected if the crude protopathic sensation of these organisms should prove to be an undifferentiated temperature-luminous response.

The essential feature of these tropisms, whether positive or negative, is that they are directional responses, and as such are the germ of that prociency which reaches its highest development in the visual sense of man.

[After referring to the visual organs in primitive vertebrates, such as the amphioxus, the lecturer proceeded:—]

VISION IN RELATION TO EQUILIBRATION AND ORIENTATION.

"It is clear that in the visual functions of this animal we have to do only with very *primitive*, essentially *vital visual* functions. The organs do not apprehend objects, but serve merely to regulate the posture of the body in relation to the light (photostasis)" (Kappers).² In other words, the sensation is purely protopathic; and the fundamental protopathic response to light is motor—i.e., postural.

It is noteworthy here that in certain invertebrates—e.g., hydromedusæ—some possess simple pigmented ocelli, whilst others have static organs with statoliths, similar to the otoliths in the ear. The function of the static organs in the orientation of the animal is undoubted, and it would appear that at this lowly stage ocelli are capable of fulfilling the same purpose (Hesse).³

The immense importance of vision for equilibration and orientation is liable to be lost sight of, or at least underestimated, when dealing with the visual functions of man; for there the static functions are overshadowed by the more patent dynamic functions, and both are overwhelmed by the highly developed sensory and cognitive functions. A study of the anatomy of the central nervous systems and of the behaviour of vertebrates, however, demonstrates the supreme importance of photostasis in the life-histories of these animals from the lowest to the highest. Throughout, in the mid-brain, we find an elaborate coördination centre for gravistatic and photostatic reflexes, of which the afferent impulses are predominantly protopathic. This region is the great meeting-place of primitive protopathic sensory impulses—optic, static, tactile, olfactory and gustatory,—the median longitudinal bundle playing an important rôle as a collecting tract. In fishes the gravistatic system is enormously reinforced by impulses from the lateral lines, impulses which convey impressions of pressure and mechanical vibrations, controlling the movements of the animal with regard to depth below the surface of the water, and propinquity to solid obstructions.

[The lecturer then adverted to the nervous levels and paths concerned in vital reflexes in various animals.]

Clinical observations, and especially Brown-Séquard lesions, show that all the protopathic fibres—mediating pain, temperature, and undifferentiated touch—have a cell-station immediately after entering the cord, and are then relayed into Edinger fibres which decussate in the anterior commissure and pass up in the lateral columns of the opposite side to the medulla, mid-brain, and thalamus. The epicritic fibres—mediating finer tactile discrimination, muscle and joint sensibility, and deep sensation—pass up the cord in the posterior columns to the nuclei cuneatus and gracilis, and are thence relayed to the median fillet, decussating only when they reach the medulla (Petrén, Fabritius, Brouwer). The epicritic system in the cord is therefore a collection of fibres carrying impulses specially concerned in *stereognostic* perception. It cannot, however, be admitted, with Head, that a perception such as the discrimination of the distance between two compass points placed upon the skin is directly transmitted by any fibres in the cord. Such a perception involves higher syntheses than the spinal cord is capable of, and it is, indeed, inconceivable how it could be conducted by any single tract. Epicritic tactile sensibility mediates finer discrimination by finer differentiation of the crude protopathic sensation, and the psychological manifestations of this differentiation are more minutely accurate local signature and qualitative differences of greater cognitive (as opposed to affective) import. Thus, the protopathic sensations are of more immediately vital, the epicritic of gnostic import.

The foundation of equilibrium is posture, and the key to the solution of the problem of posture was the discovery of decerebrate rigidity by Sherrington.

Magnus and de Kleijn divide postural reflexes into two great groups—static and stato-kinetic. The former deal with changes in posture of the otherwise stationary animal; the latter with movements of the animal. The stato-kinetic reflexes are the more complicated, and in them the semicircular canals play a large part, whereas only the otolith organs are involved in static labyrinthine reflexes.

Static reflexes are further divided into two groups—postural reflexes proper (*Haltung*) or standing reflexes (*Stehreflexe*), and righting reflexes (*Stellreflexe*).

Standing reflexes are accompanied by *compensatory eye movements*. The tonic labyrinthine ocular reflexes are exhibited when the position of the head in space is altered, and consist of vertical and rotatory deviations. If the head is rotated to the right (right eye down, left eye up) the right eye moves upwards and the left eye downwards. If the head is rotated upwards around the bitemporal axis (as in affirmation), the eye undergoes torsion such that the top of the vertical meridian of the cornea moves forwards towards the nose. It will be seen that the labyrinthine reflexes are of such a character as to retain the visual field so far as possible in its normal orientation; but in no case is this effect fully accomplished. The effectors of the labyrinthine ocular reflexes are the superior and inferior recti and the obliques. The lateral recti play no part.

The tonic ocular reflexes initiated in the neck muscles are demonstrated in lateral flexions (negation) of the head. When the head is turned to the right the right eye turns forwards (towards the nose), the left eye backwards. Here, too, the eye movements are compensatory, and the lateral recti are involved.

The combined effects of the neck and labyrinthine reflexes are almost completely compensatory, so that the orientation of the field of vision is maintained in spite of the (passive) movements of the animal. When active movements of the animal occur stato-kinetic labyrinthine reflexes are set in action by changes in velocity owing to stimulation of the semicircular canals. These also lead to vertical, horizontal, and rotatory deviations. "These reactions are such that with a given movement of the head of an animal which is in the normal posture the eyes are moved into the position in which they will later be maintained by the static reflexes, so that they are deviated into the necessary direction at the very beginning of the movement, and there is, therefore, an extraordinarily well-developed correlation of ocular labyrinthine and neck reflexes, by means of which, both in movement and at rest, and in the various physiologically possible positions of the head with respect to the body and in space the correct visual attitude and the suitable correlation of the two eyes are ensured" (Walshe).⁴

Of the righting reflexes certain visual reflexes occur only in those animals which have some degree of binocular vision, and then only in the intact animal. They differ, therefore, fundamentally from all the other reflexes, in that they are subserved by the cerebral cortex (probably the visual cortex).

In active movements the coördinations between eyes and labyrinths are equally important, as are also the compensatory effects of each upon the other. In the primates and in man, with the development of binocular vision, vision comes more and more to dominate the labyrinth, acting vicariously for the labyrinth in case of need. The distance-receptor, smell, was the foundation upon which the neopallium was begun, and upon the distance-receptor, vision, it attained its highest perfection in man. Upon the labyrinth was built the "ganglion of the proprioceptive system," the cerebellum. Just as the cerebrum is the highest—apocritic—differentiation and integration of exteroceptive impulses, so the cerebellum is the highest—apocritic—differentiation and integration

of proprioceptive impulses, itself under the domination of the cerebrum for the unification of the animal's "self."

THE SENSORY FUNCTIONS OF VISION.

The universality of the dual mechanism in the exteroceptive sensations would naturally lead one to seek for evidence of the same duality in vision. It must, however, be remembered that the superposition of an epicritic upon a protopathic mechanism not only leads to the subordination of the latter, but also to alterations in its characters. Protopathic touch is characterised by the intensity of the reaction, though accompanied by vagueness and crudity, absence of exact localisation and discrimination, radiation to distant parts, and pronounced affective tone, usually unpleasant. The response is of the all-or-none variety—i.e., any stimulus which surpasses the threshold produces the maximum effect—there is no gradation. Any reflex motor response is of the same ungraded nature—i.e., it is a "mass-reflex" (Head and Riddoch). When, after division of a sensory nerve, epicritic sensibility returns, protopathic sensibility undergoes definite modifications. "Some of its elements persist and combine with elements of the epicritic stage to form features of normal cutaneous sensibility. Certain characters are suppressed or inhibited, especially radiation and distant reference. Similarly, the mass reflex occurring in complete transverse lesions of the spinal cord is suppressed in the normal subject. In these suppressions "*Such elements as are serviceable are utilised when the later and higher forms of sensibility came into existence. . . . It is only those of early sensibility which are incompatible with later developments which are suppressed*" (Rivers).⁵

The Duplicity Theory.

One of the best supported hypotheses relating to vision is the so-called duplicity theory.⁶ According to it, scotopic vision, or vision under low intensities of illumination by the dark-adapted eye, is carried out by means of the rods, and photopic vision, or vision under higher intensities of illumination by the light-adapted eye, is mediated by the cones. It would seem at first sight that we have here ready to hand the duality which is demanded by the protopathic and epicritic theory. And, indeed, there are many facts which strongly support this view.⁷ Scotopic vision shows many of the characteristics of protopathic sensibility, especially in its vagueness and crudity, its undifferentiated character, and lack of exact localisation and discrimination. Photopic vision shows many of the characteristics of epicritic sensibility, especially in its meticulous exactitude of localisation and discrimination—the highest indeed which has been acquired by any form of sensibility⁸—and in its greater *differentiation qualitatively in the perception of colours*.

On the other hand, special features of protopathic sensation are its "all-or-none" reaction and its tendency to initiate a "mass reflex." The protopathic light-sense, so far as it has been investigated at present, does not exhibit either of these characteristics. But if we regard it in its primitive manifestations it is more than probable that it then exhibited both. In higher animals it has become differentiated into the epicritic phases, but still persists in modified form underlying the epicritic manifestations. The primitive protopathic light-sense we must regard as vague, diffuse, and not accurately localised. If it persisted in this form unmodified, when the light-sense became more definitely projicient it would interfere with exact discrimination. The suppression of these features, however, has become complete only in the macula, the area of distinct vision. Further, the projicient senses are concerned with the initiation of anticipatory or precurrent reactions. It is the contact exteroceptors which are specially concerned in consummatory reactions.⁹ Anything in the nature of a mass reflex action to projicient sense stimulation would frustrate the object of this adaptive mechanism;

hence the modification of such a response from the protopathic light-sense.

But if protopathic vision has lost some of the characteristics of primitive protopathic sensibility it appears to have gained some epicritic characters in its manifestations in normal man. Thus, it shows gradation, as exemplified in the luminosity curve of scotopic vision. Moreover, it is not improbable that in certain conditions it can show some of the qualitative differentiations of epicritic vision under strong intensities of excitation. There is practically no evidence as to what happens to the scotopic mechanism when the intensities of stimulation are such as to educe photopic vision. If the stimulus is increased above the chromatic threshold, what happens with regard to the scotopic mechanism? Is it inhibited, as the protopathic optic thalamus is inhibited by the cortex, which is predominantly epicritic in function? Is it short-circuited—perhaps owing to the complete bleaching of the visual purple—or does it contribute to the brightness element of photopic vision, or does it acquire all the characteristics of photopic vision, contributing not only to the brightness, but also to the other qualitative—chromatic—effects? Now, one of the greatest difficulties, hitherto unsurmounted, of the duplicity theory is the behaviour of the periphery of the field of vision. There is overwhelming proof, derived from peripheral luminosity curves, minimal field and minimal time luminosity curves,¹⁰ that peripheral vision behaves in exactly the same manner as central vision, but with diminished sensitivity. Greater stimuli are required to produce equivalent responses, but if the stimuli are sufficiently great, the differences disappear, including even the qualitative differences, so that the fields of vision for colours extend to the extreme periphery.¹¹ Anatomically, the peripheral retinal neuro-epithelium consists almost entirely of rods—the scotopic or protopathic mechanism. It seems probable, therefore, that under high intensities of excitation in normal man the protopathic mechanism is capable of giving the same chromatic responses as the cones, or essentially epicritic mechanism.

THE APPRECIATION OF MOVEMENT IN THE LOWER VERTEBRATES.

One outstanding feature of vision in the lower vertebrates is the appreciation of movement. This is an adaptation of the highest biological significance, since upon a rapid apprehension of movement in enemy or prey may depend the preservation of life. It is therefore to be expected that this characteristic will be bound up with the most primitive type of visual sensibility. There is no doubt that great acuity in the perception of moving objects is a prominent characteristic of the panoramic vision of lower animals, both herbivora and carnivora—probably more in the former than in the latter. There can also be little doubt that in these animals, although vision has already undergone some differentiation and has acquired some epicritic characters, it is essentially protopathic, even if not of the most primitive type. If in man the rods are the organs of protopathic vision we should expect them to exhibit those physiological attributes which, when synthesised with other attributes, permit of the perception of movement. And it is, indeed, found that perception of movement is most acute when the image falls upon peripheral parts of the retina. This is very strikingly demonstrated by the persistence of flicker in the periphery when it has already ceased for the same rate of alternation of stimuli at the centre.¹² We might also expect that in recovery from lesions which abolish peripheral parts of the field of vision the appreciation of movements of objects would be restored before the appreciation of shape or colour. Wilfred Harris,¹³ in 1897, pointed out that this was so in cases of transient hemianopia following epileptic attacks, and Riddoch¹⁴ has brought forward still more conclusive evidence derived from war injuries of the occipital lobes. The conclusion which Riddoch draws, which is comparable with Head's tracts of tactile discrimination—viz.,

that a sensation of movement should be regarded as a primitive function of the peripheral retina, cannot be admitted. Like tactile discrimination, the appreciation of movement is a perception, dependent upon change of local sign, and therefore involves a synthesis of such a nature that the peripheral mechanism alone cannot effect. Striking evidence of the part played by the cortex in the perception of movement is afforded by a case of bilateral lesions of the occipital lobes reported by Pötzl.¹⁵ If a strong source of light was moved slowly or rapidly before the eyes the patient did not seem to apperceive the movement of the object, but interpreted it as several separate lights.

The extreme sensitivity to movement is due to the low stimulus threshold of the scotopic mechanism and its capacity for summation whereby subliminal stimuli surpass the threshold if they are reinforced numerically, either by increase in the area excited or by successive excitation of neighbouring points. In addition to these factors, it is necessary that the response should be of short duration, dying away rapidly under continued excitation. This is indeed a very well-marked feature of stimulation of the peripheral parts of the retina. It is usually attributed to rapid fatigue, but it is very doubtful in my mind whether fatigue, properly so-called, occurs in the retina at all. The rapid fading is much more likely to be due to a form of induction, which produces a refractory period.¹⁶

The all-or-none reaction of the most primitive form of protopathic sensibility negatives not only gradation, except in so far as this can be accounted for by recruitment, but also adaptation in the sense in which this term is used in physiological optics. Yet in man it has become endowed with both. It shows, however, scarcely any trace of gradation in what is commonly described as "form vision."

PHOTOPIC VISION EPICRITIC.

The photopic mechanism, mediated by the cones of the retina, shows all the characteristics of epicritic sensibility. It is minutely graded, following, like other sensations and most perceptions, the well-nigh universal Weber-Fechner law over all ranges of intensity except the very high and the very low. It is not only thus graded in intensity, but also in extensity, displaying minute discrimination as regards local sign. This is the basis of visual acuity, which in the case of contour displacements may reach the extraordinarily high value that is involved in the discrimination of so low a visual angle as 2" (Andersen and Weymouth).¹⁷

Photopic vision also shows the richest qualitative differentiations of any sense, its only competitor being hearing. Whereas scotopic vision is under normal conditions capable only of an undifferentiated "vision brute," photopic vision manifests itself in all the colours of the rainbow and a few more.

But, while photopic vision is pre-eminently epicritic in these higher differentiae, it also resembles epicritic sensibility in general in retaining the fundamental quality of protopathic vision. The mere untuned brightness or luminosity of scotopic vision pervades every photopic response as a brightness which everyone recognises but which is so difficult to define. Thus, Helmholtz says, "I have the impression that in heterochromatic luminosity equations it is not a question of the comparison of one magnitude, but the combination of two, brightness and colour glow, for which I do not know how to form any simple sum and which I cannot further define in scientific terms." The perceptual pattern is still relatively undifferentiated, and at the lowest intensities it becomes indistinguishable from the protopathic pattern.

For if we study the threshold of vision in the rod-free area of the retina we find that the total quantity of light—i.e., the product of the area stimulated and the illumination—must attain a certain value, and it makes no difference how the quantity and the area are varied so long as the product is the same (Ricciò).¹⁸

Here we have a precise mathematical law, which holds for these most differentiated structures, but does not hold for peripheral retina.¹⁹ Asher found that for the range of light intensities used by him, the apparent size up to a visual angle of 2'-3' depends entirely upon the quantity of the light. By varying the area and the intensity of the light smaller areas may be made to appear larger than really larger areas. The so-called "magnitudes" of the stars depend upon this fact. Similarly, with regard to colours, Charpentier showed that the chromatic threshold also depends upon the area stimulated. As might be expected, for the more highly differentiated colour-sense, the law associating area stimulated with intensity is not so simple as for white light. Further, as Abney²⁰ has pointed out, as the intensity of the light is diminished gradually to extinction of the sensation, a coloured square or disc becomes first an ill-defined fuzzy patch of grey and appears finally to depart almost as a point. It appears to me that these liminal stimuli reproduce the characteristics of primitive chaotic sensations, in which size, colour, and other qualities are but little differentiated—in other words, the protopathic sensation.

If Head and his colleagues are correct in saying that the temperature sensations are common to both protopathic and epicritic systems, but differ from the two systems in range, &c., these are comparable to luminosity in protopathic and epicritic vision.

So far as affective tone is concerned it is undoubtedly enhanced in epicritic vision in man, owing to the appreciation of colours. It is, however, probable that the affective tone of protopathic vision in lower animals is much greater than in man; and the affective tone in man is largely the result of higher—conceptual—syntheses, mediated by the complex association system of the cortex.

It has already been pointed out that movement is more readily discerned when the images fall upon the periphery of the retina—i.e., in the eminently protopathic area. It is, however, also mediated by the epicritic system in the macular area. There is, indeed, evidence to show that the physiological factors which have already been described as subserving the perception of movement at the periphery also obtain in less evident degree at the macula. Andersen and Weymouth attribute an important function to movement in the binocular discrimination of depth. As already mentioned, they find the threshold extremely low, corresponding to retinal displacements far less than one cone-diameter. They think that this can be explained by visual stimuli giving rise to a complex percept of position, which they call the retinal mean local sign. At least three factors contribute to this: (1) The mutual effect of adjacent retinal elements in either retina; (2) the averaging of the successive stimulus patterns on each retinal mosaic caused by the constant slight eye-movements; (3) the combining of the two simultaneous stimulus patterns presented to the two eyes. They do not, I think, take sufficient account of induction, whereby the irregularities produced by the irregularly distributed cones are smoothed down by inhibition of the unstimulated or relatively unstimulated neighbouring cones, a function comparable to reciprocal innervation. Moreover, as Sherrington has pointed out, this facilitation of visual acuity is an example of immediate induction. He has found that osmic-stained nerve-fibres of 4 μ diameter are visible to the naked eye. Similarly, just as a moving point in the peripheral field is more visible than a line of similar length, direction, and duration, so a row of dots individually below the minimum visible and too far apart for their retinal images to overlap by diffusion becomes visible. Hartridge also says,²¹ "Contours of all kinds are met with to a very great extent in ordinary visual observation, and it would appear that the important phenomenon of simultaneous contrast has been specially developed in order that the appreciation of contours should be facilitated. The narrowness of a contour of which the eye can perceive the existence is therefore a matter of far greater impor-

tance in vision than the fineness of a grating or the closeness of two double stars that can just be resolved."

EPICRITIC DIFFERENTIATION THE BASIS OF COLOUR APPRECIATION.

Epicritic differentiation reaches its highest development in vision among all the senses, for upon it depends the appreciation of colours. The study of colour vision, however, shows that, complex as it is, it is by no means as elaborate as the vast range of hues which we can discriminate would lead us to suspect. The late Lord Rayleigh claimed to be able to discriminate between the hues of the two sodium lines, a difference of less than 1 $\mu\mu$ wave-length, and under favourable conditions 150 or more hues can be detected in the spectrum.²² Newton, however, proved that all these hues and others outside the range of the spectrum (the purples)—in fact, with very few exceptions²³ every perceptible hue—can be reproduced by the mixture of radiations of three wave-lengths suitably chosen. This is a fact of such profound theoretical importance that in my opinion no theory of colour vision is adequate in which it does not play a fundamental and preponderant rôle. Thomas Young first recognised that the totality of physiological activities comprises far fewer elements than the objective stimuli, and that a triplex physiological mechanism, each part of which responds appropriately to spectral radiations, would suffice to explain a vast number of the facts of colour vision, thus reducing the independent variables from an indefinitely large number to three.

It is not my intention here to discuss theories of colour vision. The data in favour of the trichromatic theory are well known, and the arguments against it have been even better advertised. It is clear that if the trichromatic theory is true the explanation of the evolution of epicritic vision from the primitive protopathic form is very much simplified. The theory was founded upon the responses of the eye to mixtures of various light stimuli, and for many years rested upon these facts. Of recent years much confirmatory evidence has been derived from the study of the time relations of the responses. The antagonistic facts were derived chiefly from observations upon simultaneous and successive contrast, and Helmholtz did scant service in attributing these to psychological causes. Recent work has shown that many, if not all, of these facts are elucidated by a better knowledge of induction, and are as much "physiological" as the facts of colour mixture.

One of the most striking and least explicable facts of colour vision is the eliciting of chromatic responses by pure black and white stimuli. The best known method of producing them is by means of Benham's top, though Fechner had already drawn attention to them in 1838.²⁴ There can be little doubt that the true explanation in its main outline has been adduced by Piéron.²⁵ It has long been known that the response to a light stimulus is in the form of a wave of sensation, which, with strong stimuli, rises very rapidly to a maximum and then falls at first rapidly, and then more slowly. With weaker stimuli the curve is flattened out:²⁶ the stronger the stimulus the more rapid both the rise and the fall of the response—according to Piéron both are proportional to the fourth root of the intensity when the cones are stimulated. It has further been shown that the response to red rays* is most rapid, that of violet rays least, and that of green intermediate. When we take into consideration the so-called "hypermaximal phase," the peak of the curve which is the first stage of the response, and the time relations as determined by Broca and Sulzer,²⁷ the colours observed with Benham's top are completely explained, as shown by Piéron's observations and diagrams. What, however, is not so readily explained is that the colours are only observed in juxtaposition with the black lines, and not over the white surface. Piéron's explanation of this fact is obscure and

* This inaccurate terminology is used for the sake of brevity.

unsatisfactory.† It is probable that the true explanation depends upon reciprocal induction.

By means of a rotating sector or episcope Charpentier and others have studied the duration of the visual response to a flash of light. The criterion of duration is the critical frequency of alternation of light and dark—i.e., the point at which flicker disappears. When the durations for individual wave-lengths of a spectrum are plotted as ordinates against the wave-lengths as abscissæ, a curve is obtained which is called a "persistence curve." Since the duration varies inversely with a function of the brightness—as proved for a very wide range of intensities by Porter, and confirmed by innumerable observers since²⁸—the lowest part of the persistence curve corresponds to the brightest wave-lengths—i.e., lower points mean greater brightness. Obviously, too, if the reciprocals of the durations are plotted against the wave-lengths we obtain the luminosity curve of the spectrum. In fact, flicker photometry is now recognised as the most accurate method of heterochromatic photometry.

ALLEN'S RESEARCHES ON "FATIGUE."

By investigating the effect of so-called "fatigue," with spectral colours upon the persistence curve, Frank Allen,²⁹ professor of physics at Winnipeg, has discovered a number of facts which are of great importance to the theory of vision.

[The lecturer here entered into the subject of Allen's researches in considerable detail, and finally summarised them as follows:—]

(1) Stimulation of one area of a retina with light causes—

(a) *Direct effects* upon that area.

(b) *Induced effects* in all other areas—i.e., both in the same eye and in the other eye.

(2) *Direct Effects*.—With both eyes in a condition of moderate photopia:—

(a) Stimulation with white light depresses the sensitivity throughout the spectrum.

(b) Shading the eye also depresses the sensitivity throughout the spectrum.

(c) Stimulation with any given wave-length depresses the sensitivity to this region of the spectrum and enhances it for the complementary colour.

(d) With any given wave-length the depressions and enhancements show three curves affecting respectively the red, green, and violet.

(e) Stimulation with the equilibrium colours—660 μ , 570 μ , 520 μ , 505 μ , 480 μ , 425 μ —has no apparent effect upon the sensitivity of the visual apparatus.

(3) *Induced Effects*.—With both eyes in a condition of moderate photopia the effects on the unexcited areas of the same and the opposite retina are:—

(a) Stimulation with white light enhances the sensitivity throughout the spectrum.

(b) Shading an area or an eye depresses the sensitivity throughout the spectrum.

(c) Stimulation with any given wave-length enhances the sensitivity throughout the spectrum, the enhancement being most marked in every case in the red, green, and violet.

(d) Stimulation with any given wave-length enhances the sensitivity most for the complementary colour.

(e) Stimulation with the equilibrium colours has no apparent effect.

As the result of Allen's researches we are able to envisage more accurately the phenomenon of induction. As he has pointed out, they serve to prove most conclusively the physiological—as opposed to transcendental psychological—foundations of contrast. They explain on purely physiological grounds many of the greatest difficulties associated with contrast, such as the divergence from the precise complementary in induced colours (p. 952),³⁰ changes in

hue and saturation after prolonged fixation (p. 933),³⁰ coloured shadows (p. 936),³⁰ the "memory colours" of Hering (p. 938),³⁰ the Ragona Scina experiments (p. 375),³¹ some of Abney's experiments (p. 379),³¹ binocular contrast (p. 381),³¹ Fechner's paradox (p. 609),³² Bidwell's experiment (p. 618),³² and some of Edridge-Green's observations (p. 620).³²

The facts at our disposal do not render an exhaustive discussion of the elementary physiological processes occurring in the receptors, conductors, and synapses very profitable. The only firmly established fact is that visual purple is the physico-chemical substratum of scotopic vision, and hence it is natural to have some predilection for thinking in photo-chemical terms.

CONDUCTION OF VISUAL IMPULSES.

When one comes to conduction of the visual impulses, there is no good ground for imagining that it is different from the conduction of nervous impulses in other nerves. If that be so, the all-or-none character of the response discovered by Adrian and Keith Lucas holds good. The theory of recruitment for the explanation of the graded muscular response to different intensities of stimulation in motor nerves, whereby increased intensity increases the number of nerve fibres stimulated and of muscle fibres responding, meets with difficulties in the case of tactile and visual responses. As already mentioned, it may suffice to explain some of the effects in the scotopic mechanism, but it is not easy to apply it to the single cone bipolar mechanism of the epiritic system.

[Instances of inhibition in visual phenomena were alluded to, especially those of binocular and monocular struggle elucidated by McDougall's work.]

Turning now to the anatomical basis of the lower visual impulses, have we any knowledge or can we reasonably conjecture the structures which mediate the conduction and central connexions of the protopathic and epicritic systems? As is well known, the afferent visual paths from the retina in the optic nerve and tract pass to three so-called primary visual centres—the lateral geniculate body, the pulvinar of the optic thalamus, and the superior colliculus. Of them, those passing to the colliculus are undoubtedly the most primitive phylogenetically, since they are a residuum representing the survivors of practically the whole of the afferent visual fibres in lower animals, which pass to the tectum. Here they form the superficial layer of fibres, and are brought into relation with the bulbo- and spino-tectal fibres. There is no doubt, therefore, that in these animals, going down as low as the cyclostomes, the function of these optic fibres is almost entirely photostatic, and that they are protopathic. The tectum shows histological differences in mammals from the condition in lower vertebrates. The optic fibres are reduced in number and are situated below a layer of nerve cells, and therefore less superficially. Moreover, the efferent cells are raised and somewhat approximated to the optic fibres. These efferent cells send axons to the retina (tect-optic fibres of Ramon y Cajal and v. Monakow) and to the tecto-bulbar tracts. Kappers attributes this approximation to neurobiotaxis, and sees in it an expression of the predominantly reflex function of the optic fibres. "Optic reflexes in mammals are certainly not fewer, but in the primates are much finer than in lower animals."³³ The tectum receives no macular fibres, and has no cortical projection. We may conclude, therefore, that the optic fibres to the superior colliculus in man are protopathic.

There is good reason to think that the great majority of retino-geniculate fibres carry the impulses of the epicritic system, but that those which pass to the ventral nucleus are protopathic.

In primates, and especially in man, some of the optic nerve fibres, both crossed and uncrossed, pass to the pulvinar of the optic thalamus. This increase in the dorso-lateral part of the thalamus is associated with the adoption of the erect posture. It is a correlation area, receiving besides the visual fibres also fibres from the anterior peduncle of the cerebellum (Horsley and Clarke) and the red nucleus (Sachs). It is in near

† Lorsqu'une petite surface rétinienne n'est pas, ou n'est que faiblement excitée au voisinage d'une région qui est le siège d'un processus lumineux et chromatique, l'excitation de cette surface par diffusion comporte une prédominance des processus chromatiques, qui se propagent avec une intensité plus grande que le processus lumineux."

relation with the thalamo-cortical fibres to the arm region of the pre-central convolution, and its development is probably related to the increased importance of the hand and fingers as organs of exploration (Kappers). It may therefore be regarded as a "centre" for the correlation of eye and hand, and therefore of the utmost importance in stereognosis. This view is strongly supported by the fact that the pulvinar has an extremely rich cortical projection to the angular gyrus. There can be no doubt, therefore, that the retino-pulvinar fibres belong to the epicritic system.

It is easy to correlate these anatomical deductions with the vital import of the reflexes which are chiefly dependent upon protopathic vision, and with the gnostic import of visual sensations which are chiefly dependent upon epicritic vision. It is more difficult, and perhaps in our present state of knowledge impossible, to correlate them with the relatively feeble, but still very appreciable, gnostic import of scotopic vision.

I have built up the argument in this thesis chiefly on the known facts of visual sensations in man, in whom alone we have immediate knowledge of them. The visual organs of lower animals might be expected to afford a vast amount of evidence for or against the theory. It must be freely admitted that the evidence from this source, in the present state of our knowledge, is very ambiguous. Nor should this, indeed, be unexpected. Light-responsive organs are found in nearly all moving animals, including many of the lowest invertebrates. There is, it is true, a remarkable uniformity in the general plan of the structure of the receptor cells; but it is a uniformity which characterises all sensory receptor cells. The mosaic eyes of insects show that it is possible to have a visual organ built on so different a plan from the mammalian eye that scarcely any analogy can be drawn between them.

Confining ourselves to vertebrates we find great diversities within a common type. Speaking teleologically, this was inevitable. Adaptation to terrestrial life necessarily involved changes in the visual apparatus, life in the air yet other changes. But, apart from these gross adaptations, each species has become specially adapted to a particular environment and mode of life. In these adaptations vision, whilst nearly always retaining an important rôle, has not necessarily been the predominant sense. It cannot be too forcibly insisted that all the facts of perception are biologically determined. An exhaustive investigation of the correlation of the various senses in different animals could not fail to elicit facts of profound physiological and psychological importance. The most cursory observation of their habits and anatomical structures reveals striking differences, such as the lateral line system in fishes, the colossal lobus visceralis associated with taste in certain fishes, the great development of the trigeminal in cyclostomes, some birds (ducks and geese), the crocodile, &c., the high development of smell in monotremes, dogs, and so on. As is well known, the cortex cerebri was built up upon the basis of the sense of smell, to be replaced only later by a neopallium built up upon the basis of vision, to which man owes his supremacy. Hence the position of the primates is peculiar, and analogies which might well be expected to obtain among them are scarcely to be looked for between them and species of a totally different mode of life.

Moreover, investigations of the vision of lower animals are extremely difficult and have led to very untrustworthy results. We have no certain knowledge of the range of spectral radiations to which lower animals respond, nor the modes of their reactions. The experiments of Hess and others,³⁴ elaborate and interesting as they are, have led only to tentative conclusions.

The most promising field of investigation from the present point of view is the structure of the retina in vertebrates. The duplicity theory originated in the observations of Max Schultze and Parinaud on the neuroepithelium of diurnal and nocturnal animals.

Greiff³⁵ found that there are rods and cones in the retina of most mammals, amphibia, and fishes, the number of the rods much exceeding that of the cones. In birds cones are much in excess of rods. In most reptiles (lizards, snakes, tortoises) only cones are found; diurnal saurians have no rods, nocturnal no cones (Rochon-Duvigneaud). There are vertebrates possessing only rods—e.g., amongst fishes, rays and dog-fish; amongst mammals, hedgehog, bat, mole, and night-ape (*Nyctipithecus felinus*). There are also animals of nocturnal habits possessing only rods. Owls, mice, and rell-mice have only a few rudimentary cones; rats also possess a few cones. Hess found rods in fowls and pigeons, though they are scanty in the posterior and superior parts of the retina, which are most used in pecking.

So far then the observations seem to confirm the thesis set forth above. But if one investigates the subject more closely doubts arise. It is by no means easy—indeed, it seems to be impossible—to find any definite criterion as to what is a rod and what a cone. The foveal cones in man, for example, are in no sense conical, but resemble elongated rods—and these are the organs of "cone" vision par excellence! The extreme ambiguity is shown by Putter's³⁶ morphological classification:—

I. Outer limb cylindrical.

(a) Inner limb cylindrical. (1) Foot-piece knobbed—e.g., "rods" of rat and selachian fishes. (2) Foot-piece branched—e.g., "rods" of sparrow, "cones" of macula of men.

(b) Inner limb swollen: (3) Foot-piece knobbed—e.g., "rods" of man. (4) Foot-piece branched—e.g., "cones" of pigeon.

(c) Inner limb filamentous: (5) Foot-piece knobbed—e.g., "rods" of perch, esox, chondrostoma. (6) Foot-piece branched—e.g., green "rods" of frog.

II. Outer limb conical.

(a) Inner limb cylindrical: (7) Foot-piece branched—e.g., "cones" of fovea of sparrow, "rods" of siredon.

(b) Inner limb swollen: (8) Foot-piece branched—e.g., peripheral "cones" of man and birds, "cones" of many fishes, &c.

III. Outer limb filamentous.

(a) Inner limb cylindrical: (9) Foot-piece branched (?)—e.g., "cones" of esox.

(b) Inner limb swollen: (10) Foot-piece swollen—e.g., "cones" of siredon.

An examination of our present knowledge of the comparative histology of the retina is disappointing, and we must await further information before much help can be derived from this source.

In conclusion, though there is much in this thesis which is speculative, the speculation is of that type for which the term hypothesis should be reserved—i.e., it is that form of speculation which is submissible to experimental verification and elaboration—the only form of speculation which is of scientific value. What I wish specially to emphasise is the view that increased knowledge of the psychology of perception, in which in man vision plays a predominant part, must depend upon increased knowledge of the physiology of the special senses. And further, that the advance of ophthalmology also depends upon increased knowledge of the physiology of the eye and of vision. Ophthalmology, in my opinion, has too long been content merely to apply past knowledge. The future advance in the treatment of cataract, for example, will not, as heretofore, consist in new refinements of technique, but will be revolutionised by the biochemistry of the lens. Let us take to heart this great lesson, perhaps the most important lesson taught by the life and work of Sir William Bowman, the master whom we venerate to-day.

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(Continued at foot of next page.)

THE NASAL SINUSES AS A ROUTE OF INFECTION IN ENCEPHALITIS LETHARGICA.

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I. BY MR. LOWNDES YATES.

IN inflammatory conditions of the nasal mucous membrane we are able to recognise four main types of inflammation—namely, Type 1, where the secretion consists of clear mucus, and the cilia are either active or are fatigued by the additional work necessary to remove the mucus, if this is more viscid than normal. Type 2, where the condition is similar to the above, but the inflammation is of a higher degree, with the result that serum and leucocytes are mixed with the mucus, which is then known as muco-pus. Type 3, in which the mucus is altered by fermentation as a result of the number of micro-organisms present within it, so that it is thin and partially toxin-permeable, as a result of which bacterial toxins reach the mucous membrane, causing congestion of this, particularly in the regions of the ciliary tracks. Type 4, in which the mucous membrane is pale, the ciliary action is paralysed, the mucous secretion absent or represented by a thin whitish coagulum or by fluid material, and in which the heightened absorption in cases in which the physical conditions favour the retention of fluid for a period of 20 minutes or so, may be demonstrated by the use of indigo-carmin solution.

Heightened Absorptive Power of the Damaged Mucous Membrane.

In an examination of 23 cases of encephalitis lethargica this type of inflammation has been found in or around the opening of the sphenoidal sinus in all.

(Continued from previous page.)

5. Instinct and the Unconscious, pp. 31–32, Cambridge, 1920.
6. See Parsons: Introduction to the Study of Colour Vision, p. 215, 1924.
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31. *Ibid.*, ix., 1924.
32. *Ibid.*: vii., 1923.
33. Kappers: Loc. cit., p. 902.
34. See Parsons: Loc. cit., p. 144.
35. *Ibid.*, p. 14.
36. In Graefe-Saemisch, Hdb. d. ges. Augenheilkunde, ii., 1, chap. x.

The significance of this fact had escaped my attention until it was pointed out by Dr. Stanley Barnes, who suggested that the heightened absorptive power of the mucous membrane in these cases afforded an explanation of the manner in which the filter-passing virus reached the tissues. It follows from this, if the above hypothesis is correct, that only such members of the community as suffer from this type of rhinitis or sinusitis in this region of the nose are potential subjects of this disease, and that it is necessary for the passage of the disease from one individual to another that the air-borne and filter-passing virus of encephalitis lethargica should fall on soil previously prepared by inflammation which has resulted in the alteration of the normal mucous membrane to that of sinusitis or rhinitis, with total or subtotal paralysis of the cilia and of the mucous secretion; such alteration having been produced either as a result of a chronic rhinitis or as a result of a single heavy infection of the nasal mucous membrane of the type known colloquially as influenza. In patients who have developed encephalitis lethargica after suffering from a chronic and intense rhinitis for some years, bacteriological examination in almost all cases has demonstrated the presence of either the bacillus of Friedländer or of the pneumococcus, and the well-recognised chronicity of the nasal infection when these organisms are present affords an explanation of the occurrence of type 4 sinusitis in these cases, while in a few cases other organisms were found. In those cases in which a history of an acute or influenzal rhinitis was present, cultivation of the contents of the sphenoidal sinus revealed the presence of the *Staphylococcus aureus* together with the pneumococcus, while in one case hemolytic streptococcus was found; and it is thought that the well-known proteolytic power of these micro-organisms explains, by the assumption that they have a similar proteolytic power on mucus, the rapidity of the change in the mucous membrane, the inflammation in which is of such intensity that it passes from that of the mucous membrane with normal reaction to that of a type 4 rhinitis within the space of a few days or even hours.

With regard to the finding of the *Staphylococcus aureus* in a high percentage of cases of encephalitis lethargica occurring after rhinitis of the influenzal type, it should be noted that we have only lately found the cultural methods which we have employed slightly favour the growth of this organism, and the observations will therefore have to be repeated. The normal nose by similar bacteriological methods is sterile. If scales of mucus are dry sterilised, dissolved under sterile conditions, and kept at room temperature, the solution retains its colloid character almost indefinitely, but if mixed with a large quantity of living staphylococci it is rapidly autolysed. Small quantities of staphylococci mixed with the mucus appear to die. If the mucus is inadequately sterilised rapid autolysis occurs, which suggests that other organisms besides the staphylococcus can destroy the mucus.

The heightened absorptive power of the mucous membrane can be demonstrated in type 4 sinusitis by injection of either solutions of indigo-carmin or of phenol-sulphone-phthalein into the sinuses, when it will appear in the urine, taking about twice as long to do so as if it were injected into a muscle, but not appearing in the urine in cases of sinuses lined by relatively normal mucous membrane.

Of the 23 cases of encephalitis lethargica examined, seven gave a history of acute rhinitis following sinus pain, generally associated with some degree of ill-health.

From the above considerations it would appear that in the cases of encephalitis lethargica examined, the mucous membrane in and around the region of the sphenoidal sinus had undergone alterations of such a nature as to diminish the secretion and greatly increase the power of absorption from it. Such a condition would facilitate the passage of a filter-passing organism,

and it appears probable that the virus of encephalitis lethargica can enter the tissues with greater readiness when such a condition is present, and therefore this may be a necessary precursor of the disease. It is, however, not possible to speak definitely on this point until this hypothesis has undergone the test of time.

In cases where disease is no longer active but is slowly progressing, the washing out of the sphenoidal sinuses and filling them with eucalyptol paraffin appears at times to effect a marked improvement, but has no effect whatever upon such symptoms as are due to brain lesions. It does appear, however, in practically all cases to prevent recurrences, while in more acute cases the use of eucalyptol paraffin within the nose is well worth a trial alone or combined with washing out the sphenoid.

I am indebted to Dr. G. Eden, of the Queen's Hospital and Hospital for Nervous Diseases, Birmingham, for the provision of much clinical material on which this report is based, and to Dr. R. B. H. Wyatt, bacteriologist to the University of Birmingham, for the bacteriological examination and cultivation of material removed from the sinuses.

II. NOTE BY DR. STANLEY BARNES.

The research which Mr. Yates has carried through so successfully and recorded above is of vast interest to those of us who are concerned with the paths of infection to the central nervous system. More particularly it has been puzzling to determine how the various facts which are known with regard to encephalitis lethargica can be assimilated into a reasonable theory which will explain the path of infection in this disease. It will be remembered that Levaditi found that the mucous secretions from the mouth in cases of encephalitis were often pathogenic, whilst, as a rule, the salivary duct secretions were not so; again, it has been pointed out many times that certain individuals are carriers of the filter-passing organism, but have themselves shown no sign of the disease. Another fact which must be co-ordinated with the theory in order that the latter may be accepted is the close association with the epidemic of influenza which started in 1917.

Post-Influenzal Rhinitis as a Precursor of Encephalitis.

Now, it has to be remembered that the latter has been associated throughout its course with several types of the catarrhal group of micro-organisms, and that many cases of encephalitis whose nasal secretions have been examined have been found to be carriers of one or other of this group of bacteria. It is thus probable that after an attack of the severe type of influenza which has occurred within recent years, a certain number of people have suffered from chronic nasal disease of the type which Mr. Yates has been describing; and if these cases of post-influenzal rhinitis had been thoroughly examined, it would be found that one or more of their accessory sinuses were inflamed in accordance with type 4 as described by Mr. Yates. It is clear from his researches that certain toxins and chemical substances, such as indigo-carmin, can pass through the mucous membrane in this condition, whereas the normal mucous membrane of the sinuses is capable of preventing the access of any organism or toxin. It is thus probable that the filter-passing organism of encephalitis when absorbed into the nasal cavity of a normal individual gives rise to no symptom, but when it gains lodgment in the nose of a sufferer from type 4 sinusitis it may pass through the mucous membrane and be absorbed into the deeper tissues. This theory would thus account for the absence of nervous symptoms in those who show the presence of the organism in their nasopharyngeal secretions, and for the great difficulty which has been experienced in tracing the infection from individual to individual; for it is clear that the rule would be that there should be far more carriers than sufferers, seeing that the organism would be

spread by coughing or sneezing and be air-borne, and would only give rise to signs of encephalitis in those who also suffered from the most severe or fourth degree of sinusitis.

Path of Infection.

As to the path by which the organism reaches the central nervous system from the sinuses, it is more than likely that it does not pass by the blood-stream, but does pass by the peri-neural lymphatics along the branches of the first division of the fifth nerve and so reaches the brain. If this is correct it would also explain why so many of the cases have shown evidence of damage to the mesencephalon and pons Varolii, seeing that the ascending root of the fifth nerve is likely to carry the infection close to the ocular nuclei and the mesencephalic structures.

It has been impossible locally to confirm this theory of the mode of infectivity in encephalitis, but it fits in with so many of the observed facts that I feel certain that this is the mode of infection. I would suggest that those who have an opportunity should not only investigate the condition of the various sinuses in cases of death from encephalitis, but should also attempt to trace the organism in the first division of the fifth nerve and the corresponding portion of the Gasserian ganglion on the same side as any sinus lesion. It is possible that the olfactory nerves also act as channels for the absorption of the virus in some instances, and the olfactory bulbs might with advantage be investigated in the same way as the Gasserian ganglion.

It should be remembered in this connexion that the toxin of tetanus has been proved to be carried to the central nervous system from the peripheral focus along the nerve sheaths, so that there is every reason to believe that other organisms may give rise to infection in the same way.

Arguments on similar lines may be applied to the absorption of micro-organisms from the nasal sinuses in cerebro-spinal fever. The work of Orr and Rows showed experimentally that cocci tended to track along the spinal roots centripetally to the cord and give rise to meningitis or to myelitis. Given the original damage to the nasal mucous membrane, which is characteristic of type 4 sinusitis, such a process is likely to occur in cases where nasal infection by the meningococcus is superadded; and a tracking along nerve sheaths (twigs of the first division of the trigeminal, or branches of the olfactory) is theoretically more likely to be the path of infection than an emissory vein.

In a recent communication Behr has shown that it is likely that the infection in certain cases of disseminated sclerosis commences in the posterior ethmoidal sinuses and passes from them to the optic nerves. Here is another instance in which it is possible that a preliminary damage of the type described by Mr. Yates as type 4 sinusitis is necessary before the infective agent can pass through into the nervous system. It is realised that at this stage no decision can be reached as to the exact pathology of disseminated sclerosis beyond the fact, which is fairly established, that there is an invasion of the nervous system by some parasite; nevertheless, the large number of cases in which preliminary histories of nasal catarrh are almost the only predisposing factor in otherwise healthy young adults who develop disseminated sclerosis is of itself a strong reason for believing that there must be some causal connexion between the two.

Summary.

It is thus suggested that the infection in encephalitis (and possibly other central nervous infections) is a symbiotic process; that in the first place the nasal mucous membrane is damaged by one of the catarrhal group of organisms, and that subsequently the virus of encephalitis is inhaled, passes through the damaged mucous membrane, and is absorbed into the brain via the peri-neural lymphatics.

A CASE OF
BILATERAL PREPATELLAR BURSÆ.

BY A. TREVOR JONES, M.B., B.S. LOND.,
LATE HOUSE SURGEON, HARROGATE INFIRMARY.

THE following case of bilateral prepatellar bursæ presents some unusual and interesting features.

The patient, aged 51 years, was a charwoman who had done a considerable amount of work on her knees for the last 35 years, sometimes doing five hours' continuous work in that position. The right bursal swelling had been present for ten years and the left for six, increasing in size very gradually. They had never caused her much inconvenience, and she only had pain for about ten minutes after starting to kneel; when this had passed away she could kneel for hours without discomfort. When the bursæ were small she used to kneel on them with the anterior surface touching the floor, but latterly they projected so that the inferior surface came into contact with the floor. The skin covering this surface became abraded and septic, and she sought medical attention on this account. There was no limitation of movement at the knee-joints and the patient could move quite briskly. She had some difficulty in stooping and bending from the waist. The right bursa projected about 3-4 inches. It was hard and no fluctuation could be obtained. It was intimately connected with the patella and could only be moved from side to side with that bone. The left projected 3 inches; it was softer than the right, and fluctuant. It also could only be moved with the patella. The skin was abraded over the inferior surface. An idea of the shape and size of the bursæ may be obtained from the accompanying photograph.



Bilateral prepatellar bursæ.

The bursæ were removed by transverse incisions across the joints, the flaps of skin in the left being so arranged that the septic portion was removed. The bursæ were intimately connected with the underlying fascia, with which the fibrous

tissue of their walls was continuous. This had to be divided. The wounds healed by first intention.

After removal the size of the right was 7 cm. long, 7.5 cm. deep, and 9 cm. across. The left was 7.5 cm. long, 7 cm. deep, and 6.5 cm. across. On section the cavity in the right was found to be 4 cm. in diameter, the rest of the swelling consisting of extremely hard and avascular fibrous tissue. The cavity contained some blood-tinged serous fluid and was intersected by thin fibrous trabeculæ. Its walls were ragged and breaking down, and there was no sign of serous membrane to be seen. The cavity in the left was larger than that in the right (5.5 cm. across), and occupied a deeper position. The walls were also ragged in places and similar trabeculæ intersected the cavity. The fibrous tissue was not so thick nor so dense. The skin over the summits of the bursæ was fairly thick, varying from about 0.25 to 0.5 cm. A microscopical section showed that the walls consisted entirely of closely-packed fibrous tissue with very few blood-vessels.

It is noteworthy that the older and larger of the two bursæ was the right. The cavity was smaller, the fibrous tissue thicker and denser on that side. The patient was right-handed and stated she always realised putting more strain on the right knee when scrubbing.

I am indebted to Mr. C. D'Oyly Grange for permission to publish the case.

Reviews and Notices of Books.

PSYCHOLOGY OF THE PRE-SCHOOL CHILD.

By BIRD T. BALDWIN, Ph.D., Research Professor in Educational Psychology and Director of the Child Welfare Research Station in the State University of Iowa; and LORLE I. STECHER, Ph.D., Research Assistant Professor in the same station. London and New York: D. Appleton and Co. 1924. Pp. 305. 8s. 6d.

THIS book describes a systematic attempt to do for the mentality of the child of pre-school age what the child welfare movement is doing for his physical development. It necessarily contains accounts of investigations rather than practical educational suggestions, which can only follow upon further inquiries on these or similar lines. The results of a series of day-to-day observations and measurements from a large and varied selection of tests extending over a period of one to three years on a group of 105 children are recorded in detail. The children ranged from 2 to 6 years of age and were in attendance at the Child Welfare Research Station, Iowa. Certain physical measurements of growth were made, including roentgenograms of the carpal bones and the teeth, but the work was predominantly psychological. The tests employed included, besides scales of general intelligence, numerous measures of motor control and coördination, and certain practical perceptual and associational tests, such as the Knox cubes, Goddard's adaptation test, and Healy's picture-completion. Many are already well known, but results of trials on so young children have not been often recorded; other new tests were also applied, some of which showed considerable originality. The experiments to record the development of the senses of number, time, rhythm, and design are particularly valuable, both as tests and as means of education. The authors have throughout endeavoured to combine educational value with their investigations, and they maintain that it is a mistake to allow a child's mind to grow naturally. To deprive a little child of the instruction it craves is, they believe, to withhold the conditions of normal mental development. Definite conclusions regarding early mental development are not justified from observation of so small a number of cases, and in any case results of the application of tests made under artificial conditions require to be supplemented by the daily study of children under natural conditions by a trained observer, on the lines set out by Sully.

The book, while primarily of interest to teachers of nursery schools, deserves the attention of child welfare medical officers who wish to study the mentality as well as the physique of their subjects.

LECTURES ON DYSPEPSIA.

By ROBERT HUTCHISON, M.D., F.R.C.P., Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street. London: Edward Arnold and Co. 1925. Pp. 176. 5s.

THE writings of Dr. Robert Hutchison always possess a charm which makes them especially welcome; moreover, the author's long experience and critical outlook equip him for the difficult task which he has undertaken in the present volume. The lectures are not all equally informative. The essay on the Diagnostic Significance of Abdominal Pain and on the Chronic Abdomen, and the sections dealing with Organic Diseases, such as peptic ulcer and carcinoma of the stomach, are excellent, but, when Dr. Hutchison reaches the crux of the problem of "dyspepsia"—namely, what, in Lecture VII., he terms the functional dyspepsias—his conclusions are so vague that we doubt whether new light is shed on the indefinite and numerous group of sufferers there dealt with. Can any writer do more at the present day? We doubt it, but Dr. Hutchison has specifically set out to lecture to students on "dyspepsia" and, if this symptom is to be retained in a prominent position in medical nomenclature, it seems desirable to obtain more justification for its use than is here given.

Any disappointment which we may feel on this score is enhanced by our admiration for Dr. Hutchison's concluding lecture on the Chronic Abdomen. This address deserves recognition as a classic, but the tragic pictures described so brilliantly will only disappear when the profession has more insight into the obscure beginnings which are dealt with in earlier chapters.

INFECTION, IMMUNITY, AND INFLAMMATION.

By FRASER B. GURD, B.A., M.D., C.M., Lecturer in Applied Immunology and in Surgery, McGill University. London: Henry Kimpton. 1924. Pp. 329. 25s.

THE author believes that sufficient data regarding the phenomenon of tissue hypersensitiveness and its companion state, tolerance, have been accumulated to justify their application in medicine and surgery. He gives a clear and readable account of the phenomena of immunology which should appeal to the practising physician and surgeon for whom the book is written. If at times his explanation of certain of the tissue reactions to infection seems unduly simple and dogmatic, this is probably a fault on the right side. It may be doubted whether our knowledge of immunology is so advanced that treatment on these lines can be said to have left the experimental stage. But this book is at least a worthy attempt to introduce scientific conceptions into therapeutics, and so deserves attention.

HISTO-BIOLOGY OF THE SKIN.

Lectures on the Histo-Biology of the Skin, and Its Diseases. By Dr. JOSEPH KYRLE, a.o. Professor of Dermatology and Syphilology at the University of Vienna. Vol. I. Vienna and Berlin: Julius Springer. 1925. With 222 mostly coloured illustrations. Pp. 345.

THOSE who have had an opportunity of attending Prof. Kyrle's histological lectures will rejoice at the incorporation of 35 of them in a readable volume, admirably and profusely illustrated by a well-known artist. In the preface it is modestly suggested that these lectures may be helpful to such students as may require a general knowledge of cutaneous histology, but dermatologists will agree that the work should be placed in a much higher category than that claimed for it by the author. In his lectures on normal histology Prof. Kyrle has a happy knack of combining a detailed description of form, with an interesting, if somewhat dogmatic, dissertation on the associated physiological functions of the various structures in

the skin. This is a new and agreeable departure which should do much to obviate the lack of enthusiasm generally felt for the study of a rather prosaic subject. The volume is divided into six unequal parts. They include: (1) A description of the histology of the normal skin, (2) pigment anomalies, (3) atrophic and (4) hypertrophic disturbances, (5) mycelial infections, (6) effects of parasitic invasion. There is a short index of authors' names, and a good subject-index. The illustrations are among the best and most accurate that have ever appeared in a work on cutaneous histology, and in virtue of their faithful reproduction of important features, the number and variety of stains employed, and the careful selection of the material for biopsy, may long defy the emulation of other histologists in this field.

Dermatologists will welcome this fresh proof of Prof. Kyrle's ability and will look forward to the appearance of subsequent volumes.

HEALTH AND PSYCHOLOGY OF THE CHILD.

Edited by E. SLOAN CHESSEY, M.D. London: Wm. Heinemann. 1925. Pp. 302. 7s. 6d.

Dr. Sloan Chessy may be congratulated on having provided a book of real and big interest. Uniformity of outlook is not to be expected in a work of this kind, and it must be admitted that the majority of readers will hardly synthesise the material presented to them into a working scheme of child management, while some may be rather bewildered by the diversity of the factors which are represented as conditioning the development of the child. But as a collection of essays written from widely different points of view by authors who are well qualified to represent them, it should achieve considerable success, and will stimulate the interest of almost every reader in some aspect of the subject which will be new to him. The variety of the subject-matter may be indicated by mentioning a few chapters: Dr. E. Pritchard deals with the psychology of infancy and Dr. H. C. Cameron with want of appetite in children; the development of self-consciousness is discussed by Dr. J. A. Hadfield, the influence of endocrines and vitamins by Dr. Leonard Williams, and delinquency in children by Dr. A. F. Tredgold.

The book is clearly and attractively written, and may be recommended to all who are interested in problems of childhood.

ORGANIC CHEMICAL ANALYSIS.

A Student's Manual of Organic Chemical Analysis. Qualitative and Quantitative. By JOCELYN FIELD THORPE, C.B.E., F.R.S.; and MARTHA ANNIE WHITELEY, O.B.E., D.Sc. London: Longmans, Green and Co. 1925. With diagrams. Pp. 250. 9s.

THIS book is divided into eight sections, the first two of which are devoted to the detection of elements in organic compounds and the methods of purification of organic compounds before analysis. Then follows a section on the ultimate analysis of organic compounds in which the historical development of the subject is traced by a description of the original methods devised by the earlier workers in this field of organic chemistry. Full particulars are given for carrying out the experiments and references are quoted, so that the student is encouraged to look up original papers for himself. The fifth section, which is the longest, will also be found to be the most generally useful, containing as it does the methods of detection and estimation of all the commoner radicles met with in organic compounds, together with a number of practical applications of these methods to the estimation of some compounds of technical importance such as methyl alcohol and formaldehyde. The sixth section contains some practical hints for the systematic examination of complex organic compounds, and there is also an appendix dealing with the methods of micro-analysis.

The book forms a useful addition to the literature of the subject.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE. May, 1925.—The principal article is by E. L. Collis, and deals with the coal-miner, his health, diseases, and general welfare. It is of some interest at the present moment when the mining industry is engaging much attention. The habits of the miner with regard to food, drink, and baths are considered; his methods at work; his occupational diseases, nystagmus, beat-knee, beat-hand, and beat-elbow; his tendency to accidents; his exposure to dust—are all summarised; his social environment in regard to welfare schemes and fertility is discussed, and the relation of unrest on the different coal-fields to the prevailing mortality is pointed out. The conclusion is arrived at that the mind of the miner is affected by such things as those dealt with and expresses itself in a tendency to strike.—June, 1925. The results of two years' ophthalmology in an American manufacturing plant are set forth by H. P. Davidson, who, after 4000 consecutive examinations, found 28.5 per cent. of the men with normal vision in both eyes and 38.9 per cent. with normal vision with lenses; but among the rest there was an appalling number of amblyopias, maldevelopments, and old injuries. The findings are carefully tabulated. The writer is emphatic on the need of education to induce men to wear goggles to prevent injuries and to seek advice for their children.—The health hazards of garages are pointed out by G. M. Burnham to be considerable. Acute and subacute poisoning from carbon monoxide in exhaust gases is an ever-lurking danger. The tendency to enrich fuels with cracked petroleum, coal distillate, and even lead compounds is adding further danger. Heavy vapour from spilt gasoline may drift into a pit where a man is working or poison him if the garage be closed. The writer calls for thorough investigation to establish the damage to health resulting and to determine the best preventive measures.—An interesting description is given by P. Drinker and R. M. Thomson of a portable alternating current precipitator for determining dust, fumes, and smokes present in air. The apparatus, which is illustrated, weighs 13 lb., and samples for microscopic study can be obtained.—The need for determining the zinc content of various foods, animal tissues and bone, and excreta, in cases of both normal and abnormal contact with zinc has led R. E. Lutz to develop a method for detecting accurately amounts varying from 0.01 mg. to 0.5 mg. by the action of zinc salts on urobilin. The method is described and discussed critically, with reference to previous work done on the subject.

ROYAL COMMISSION ON LUNACY
AND MENTAL DISORDER.

FURTHER SITTINGS.

(Continued from p. 1367, June 27th.)

EVIDENCE OF L.C.C. MENTAL HOSPITALS COMMITTEE.

At the resumed meeting of the Commission on July 10th, the Hon. W. Sidney, J.P., and Mrs. Dunn Gardner, J.P. (chairman and vice-chairman of the L.C.C. Mental Hospitals Committee), gave evidence and stated that their view—supported by the Council—was that provision for temporary treatment without certification should fall on the same authority as that responsible for the established mental hospitals. Also, they thought that any legislation for early treatment of mental cases should allow patients who did not possess volition to be treated, as well as really voluntary patients. The Council considered that for compulsory detention two medical certificates—one from a specially approved general practitioner—should be required. The number of medical officers treating mental cases under the Council had of recent years been considerably increased. Hospitals with 2000 patients or over were allowed eight assistant medical officers. The Council did all they could to

induce young medical officers to obtain the diploma in psychological medicine, and had arranged courses of lectures at the Maudsley Hospital for post-graduate students in this regard. The eighth course was now being delivered. Leave was also granted to attend a three-months course at the same hospital. Here was the chief pathological laboratory in connexion with the London County mental hospitals. The director of this laboratory was Dr. F. L. Golla, who followed Sir Frederick Mott, the latter now occupying the chair of mental pathology at Birmingham University. A properly equipped laboratory was provided at each mental hospital under the Council, and Dr. Golla conducted a periodic inspection of these laboratories, and reported on the work being done in them.

With regard to the nurses in the Council's mental hospitals, every inducement was held out to them to gain the mental nursing diploma. Recognising the onerous and somewhat distasteful work these nurses were sometimes called upon to do, and in order to make the staff as contented with their conditions as possible, the Council had shortened the hours and increased the rate of remuneration paid. It was difficult to secure a sufficient number of suitable women for this nursing work.

ASSOCIATION OF MUNICIPAL CORPORATIONS.

On the following day, July 11th, evidence on behalf of the Association of Municipal Corporations was given by Sir Lewis Beard, the town clerk of Blackburn. He said the average yearly increase in the number of patients who needed treatment in mental hospitals in England and Wales for the years 1920 to 1923 was 3565, and his Association's suggestion—until building was a less burdensome matter—was that use should be made of vacant institutions under the control of the Poor-law guardians. These, he thought, could be used for the more chronic type of case, and this would release space in the usual mental hospitals for acute cases in which treatment was likely to bring results. He had in mind the ordinary residential wards of the Poor-law institutions. His Association, he said, supported the Mental Treatment Bill, and their view was that it ought to be made possible to treat incipient cases without first having them certified. His individual opinion, also, was that it would be well if local authorities were to undertake the instruction of the public as to the general nature of mental disorder and the need for it to be treated at quite an early stage. A further advantage of this would be the dissipation of much of the unfounded prejudice in regard to insanity and the methods of treating it.

He had had a good deal of experience as a visitor to asylums, and suggested that committees appointed to do the visiting should be named "mental hospital committee" as he thought the usual name of "visiting committee" conveyed the impression that the inspection was of a perfunctory character, instead of the careful and interested inspection which was needed. He was against the Board of Control being given mandatory powers in place of the present advisory functions, as he wished to preserve to local authorities a good deal of freedom concerning details.

GIFT TO THE NATIONAL ORTHOPÆDIC HOSPITAL.—

Mr. Dudley Docker has promised to contribute £5000 towards the £87,500 required by the Royal National Orthopædic Hospital on condition that four others will give a similar amount.

MEMORIAL TO THE LATE DR. WALLACE BEATTY, OF

DUBLIN.—On July 6th a tablet to the memory of the late Dr. Wallace Beatty was unveiled in the hall of the Adelaide Hospital, with which he was so long connected. In addition to erecting the tablet the committee in charge of the memorial has in its hands a fund from which it is hoped to help nurses and students of the hospital financially embarrassed. The ceremony of unveiling was performed by Dr. Walter Smith, Dr. Beatty's predecessor at the Adelaide Hospital. He referred briefly to Dr. Beatty's fame and skill as a dermatologist, and more especially to his kindness, charity, and character as a man.

THE LANCET.

LONDON: SATURDAY, JULY 18, 1925.

TOWARDS THE SOLUTION OF THE CANCER PROBLEM.

THE publication in THE LANCET to-day of the paper by Dr. W. E. GYE on "The Ætiology of Malignant New Growths," marks an event in the history of medicine. For these observations may, we believe, represent a solution of the central problem of cancer. His carefully controlled experimental evidence leads to certain fundamental conclusions which may be briefly summarised as follows:—

1. All malignant new growths contain an ultra-microscopic virus—or group of viruses—which can be cultivated. This applies to the carcinomata and sarcomata of fowl, mice, rats, dogs, and man. The virus resides probably within the cells of the neoplasms.

2. The virus alone, washed free from all adherent material, does not produce a tumour when injected, and does not even produce a visible lesion.

3. But when injected together with virus-free extracts of tumours the virus produces a malignant new growth. The extracts contain, therefore, a substance called by Dr. GYE the "specific factor," which enables the virus to attack the cells of the injected animal so as to transform them into cancer cells.

4. There is no species specificity so far as the virus is concerned, for tumours can be obtained in one species of animals with the virus obtained from the tumour of another species.

5. The "specific factor" shows a very strict specificity of species. Thus in order to produce a malignant new growth in a mouse it is necessary to use the specific factor from a mouse tumour, while the specific factor of a chicken tumour is ineffective.

6. There is probably also a strict specificity of tissue for the specific factor. So far only sarcomata have been obtained, and these only with a mixture of virus and the specific factor from sarcomata, not from carcinomata.

The existence of a virus is not merely postulated from the effects of a culture supposed to contain it, as has hitherto been the case. The paper by Mr. J. E. BARNARD on "The Microscopical Examination of Filterable Viruses" follows Dr. GYE's communication, and in this he has applied the optical methods elaborated by him for the study of the organisms of bovine pleuro-pneumonia, the largest of the known filter-passing viruses, to the study of the cancer viruses cultured by Dr. GYE, and shows that he has succeeded in rendering the cancer virus visible and even in photographing it. This is in itself a great achievement. The results of Mr. BARNARD's observation so closely correspond with the experimental results obtained by Dr. GYE that the existence of a living cancer virus would appear to be established. The reasons for this broad opinion follow.

In order to make clearer the relationship existing between the virus and the specific factor, definite

examples may be given. We will call the virus obtained from a mouse tumour "mouse virus," from a human tumour "human virus," and so on. Similarly we will call the "specific substance" obtained from a mouse carcinoma "mouse carcinoma specific," from a human carcinoma "human carcinoma specific," from a fowl sarcoma "fowl sarcoma specific," and so on. Then the following relationships have been established experimentally after injection:—

(a) Any virus alone from any neoplasm into any animal: no effect.

(b) Any specific from any neoplasm into any animal: no effect.

(c) Mouse carcinoma virus + fowl sarcoma specific: (1) Injected into mice—no effect; (2) injected into fowls—sarcoma.

(d) Human carcinoma virus + fowl sarcoma specific injected: Into mice—nothing; into fowls—sarcoma.

It follows, therefore, that the type of malignant new growth that is produced depends not upon the virus, but upon the specific substance. There are, therefore, two factors concerned in the ætiology of cancer: (1) A living virus—the extrinsic factor; and (2) a chemical substance produced by the cells—the intrinsic factor.

The "germ theory" of cancer is, of course, not a new one. It has often been advanced and has as often been rejected. It has been pointed out in the past, and quite truly, that it does not explain cancer. Recently an American authority on cancer has gone so far as to make the categorical statement: "There are many things which we do not know about cancer to-day, but there is one thing that we do know and that is that it is not of germ origin." That is not merely the opinion of a single individual, but it represents the view of almost every pathologist of repute. That view is not merely justified by the consideration that in the past no one has ever isolated an organism which when injected would produce with certainty a typical malignant new growth. As we shall see it is true even to-day in the light of Dr. GYE's work to say that the presence of an organism *by itself* cannot account for the fundamental features of cancer, and if the statement quoted above had been formulated in this way no exception could be taken to it. The position may be stated more generally by saying that cancer cannot be explained by postulating an entirely extrinsic origin.

Why, then, do we accept Dr. GYE's observations as a solution of the cancer problem? In order to appreciate the full significance of this work it is necessary to review briefly the present state of the cancer problem. A brief historical summary of the development of cancer research shows both the peculiar dilemma with which every attempt at explaining cancer was faced and the brilliant way in which Dr. GYE has dealt with it. Up to the beginning of this century the investigation of cancer was entirely in the hands of morbid anatomists and morbid histologists. They described the morphological appearances of the different tumours found in man and classified them; they made the fundamental distinction between neoplasms derived from epithelial cells and from connective tissue cells; they showed that each individual tumour had individual morphological features, and that these features were retained by the metastatic deposits; they correlated different degrees of malignancy with morphological differences. From the point of view of treatment the most important contribution was the work of RIBBERT and of BUTLIN.

The former from a study of early carcinomata showed that cancer in its inception was a local disease. BUTLIN, applying this conclusion to surgical treatment, emphasised the importance of operative removal at the very earliest stage of cancer and demonstrated in this way that cancer, if attacked sufficiently early, was a curable disease.

There was also a considerable output of theories concerning cancer. Every possible—and impossible—explanation that human ingenuity could devise was put forward. Fortunately it is not necessary to review these various theories. It is sufficient to say that they have not assisted in the investigation of cancer; it may be said that these guesses at the truth have been of as little value to cancer research as racing tips are to the breeding of horses.

The exclusive occupation with cancer as it occurs in man led, however, to one curious result: it gave rise to the belief that cancer was essentially a disease of man. When in 1888 HANAU described a tumour in a rat and successfully transplanted it into other rats, this important observation was allowed to pass unnoticed. The same fate befell the similar observations which MORAU made soon afterwards. If we consult the standard work of the time, BORST's big volume, published in 1902 and entitled "Die Lehre von den Geschwülsten," no reference at all is to be found to the tumours of animals, although the occurrence of such tumours was well known to veterinary pathologists who had published descriptions in the literature. When, therefore, in 1902 Prof. JENSEN, of Copenhagen, recorded the successful transplantation of a mouse carcinoma into other mice after previous attempts with three other carcinomata had failed, his work did not attract much attention and would probably have shared the fate of HANAU's and MORAU's but for a fortunate coincidence. In 1902 the Imperial Cancer Research Fund had come into existence. The late Dr. E. F. BASHFORD, who had been placed in charge of the work of the Fund and who in his preliminary scheme of investigation had emphasised the importance of placing cancer research on an experimental basis, recognised the value of JENSEN's work and devoted all the resources of the new institution to make the study of cancer one of experimental and comparative pathology. Together with Dr. J. A. MURRAY, he showed that the phenomenon of cancer was common to the whole vertebrate kingdom. By studying the pathology of JENSEN's tumour and other tumours in mice, these two workers showed that these tumours corresponded in every respect to cancer in man. They confirmed JENSEN's conclusion that in the process of transplantation the transplanted tumour grew from the cells of the minute piece of tumour that had been introduced by the needle and not by a transformation of the cells of the new host, who only provided the stroma necessary to nourish the cancer cells. This meant that the experimental transmission of a tumour from one animal to another was not a process of infection but one of true transplantation. Every spontaneous tumour in mice that was investigated was shown to possess a definite biological individuality which manifested itself not only by its morphological appearance, but also by such features as its rate of growth, its tendency to necrosis or spontaneous absorption, its power to elicit a specific stroma reaction. What is more, every tumour retained this biological individuality through many years of transplantation, and there was no evidence of convergence to a common type. Although a successful transplantation, of a mouse tumour into other mice was comparatively easy, it was found impossible to

transplant a mouse tumour into animals of a different species. This strict species specificity explained the negative results which had attended previous attempts, such as those of SHATTOCK and BALLANCE, to transplant a human cancer into animals. The transplantation of a cancer from one mouse to another was found to be dependent upon the life of the transplanted cancer cells. Inoculation of extracts of tumours or dried tumour material failed to produce new growths, and similarly negative results were obtained when the tumour cells had been kept in an incubator sufficiently long to impair their vitality.

Another important conclusion which followed from these observations was that when a cancer arises in an organism it arises there *de novo* as a result of a change in the cells of that animal and not by the introduction of a cell already cancerous from another animal; each case of cancer was, so to speak, an individual disease. Results such as these could not be accounted for readily on the basis of a germ theory pure and simple. We should have to assume a highly specific virus not only for each species of animal but even for each individual case of cancer. As if to emphasise this conclusion there was on record a tumour of the dog which, though indistinguishable from a typical sarcoma in its morphological appearance and its property to metastasise freely, clearly showed from its clinical history that it did not arise *de novo* but was transmitted during coitus from the vagina to the penis and vice versa. This venereal tumour had been the subject of careful experimental study by BELLINGHAM SMITH and J. W. WASHBOURN in 1897. They clearly recognised the infective nature of the disease—a conclusion which was confirmed by BASHFORD and MURRAY, who contrasted it with the tumours of mice, and by most subsequent observers. It was accordingly called either an infective granuloma or an infective sarcoma, even though no infective agent could be isolated. It has never been clearly established whether the tumour was transmitted during coitus by a process of infection or by the rubbing in of living cells from a tumour on the penis into the vagina, and conversely from a tumour in the vagina into the penis. But whatever the process was by which it was transmitted, it was clear that it did not arise *de novo* in each animal in the same way as most neoplasms arise. Here, then, was the first clear evidence that tumours existed which could not be distinguished morphologically from a typical sarcoma but which had apparently quite a different aetiology.

Other evidence soon followed, but the attempt to place cancer research on an experimental basis by studying it in animals met at first with violent opposition by many pathologists. They maintained that cancer in mice was a disease quite different from cancer in man. But by the persistent accumulation of facts, BASHFORD and his collaborators carried the day. Cancer research institutes were established all over the world where the various aspects of the cancer problem were being studied experimentally in animals.

Then a really extraordinary observation was made in 1911 by Dr. PEYTON ROUS, of the Rockefeller Institute. In a fowl he found a sarcoma which could be transmitted to other chickens not merely by the introduction of the living tumour cells, but also by an extract which had been rendered cell-free by filtration through a Berkefeld filter. The same successful result could be obtained with the dead tumour material which had been dried and kept for some time. Pursuing this line of investigation he found two other sarcomata in fowls showing the same properties. But not all tumours of fowls behaved in this way:

many of them, like the tumours of mice, failed to yield tumours with the cell-free filtrate or the desiccated tumour. Here, then, was convincing experimental evidence that in certain cases a tumour could be produced *de novo* either by a living virus or by a chemical agent. And the most perplexing feature of these extraordinary observations was this: Each of the three sarcomata showed a very distinctive biological individuality in their morphological appearance—one of them, for instance, being an osteo-chondrosarcoma. Tumours which were produced by the cell-free filtrate or by the dead dried tumour material retained this biological individuality in the same way as did the mouse tumours which depended for their propagation on the living tumour cell! The most obvious explanation appeared to be that these tumours were due to a virus. But if that was so, why did the virus reproduce the biological individuality of each tumour? There seemed to be no answer to that question, and PEYTON ROUS, after having contributed one of the most important and disturbing observations, retired, baffled, from cancer research, as EHRLICH had done before him.

The next advance in cancer research was made by FIBIGER. He produced cancer of the stomach in rats by allowing a nematode to develop in the wall of the stomach. Once the carcinoma had developed it could be propagated in other rats in the usual way by the transplantation of the living tumour cells so that the presence of the nematode was not an essential factor in the growth of the tumour once it had been induced. Similarly BULLOCK and CURTIS, in the Crocker Institute in New York, produced sarcomata in the liver of rats by infecting the rats with the eggs of *Tania crassicolis*. The sarcomata then developed in the walls of the cysticercus cysts. YAMAGIWA and ISHIKAWA, interpreting these results as being due to chronic irritation, produced epitheliomata in rabbits and mice by the prolonged painting of the skin with tar.

This line of investigation on the experimental production of cancer again offered no evidence in favour of the germ theory of cancer. On the contrary, the multiplicity of agents capable of inducing cancer, the long latent period in tar cancer, the cellular hyperplasia preceding the cancerous change had to be interpreted as arguments against an extrinsic origin and in favour of an intrinsic origin of cancer. Now that we know the solution, it is fascinating to retrace the history of experimental cancer research and to see how the objective, unbiassed collection of observations bearing on cancer in animals had led up to this dilemma: there was a large body of observations which could not be accounted for satisfactorily by postulating an organism as the cause of cancer. They indicated rather that the cancerous change was associated with a change in the metabolism of the cells, perhaps the production of a substance stimulating growth as indicated by the studies of CARREL, BURROWS, DREW, and others on the cultivating of cells *in vitro*. On the other hand, there were the tumours described by ROUS and the venereal dog tumour which, though morphologically typical malignant new growths, seemed to have an entirely different ætiology and could be explained most readily by postulating an infective agent. Most workers tried to escape from this maze by setting aside tumours such as those described by ROUS as being infective granulomata and by making a sharp distinction between such tumours and true neoplasms. But such a conclusion was merely an attempt to evade the difficulty. As has been stated, the fowl tumours were morphologically and clinically indistinguishable from true neoplasma, and apparently arose *de novo* in each

animal, and their infective nature could only be established by experimental methods. How was it possible, then, to decide whether a tumour in man was an infective granuloma of this type or a true neoplasm? It has also been stated that the fowl tumours retained their biological individuality, when they were induced by infection with the cell-free filtrate. If it is admitted that a virus can produce a cell proliferation of as definite a biological individuality as a true neoplasm, this feature of true neoplasms ceases to be an argument against the parasitic origin of cancer. CARREL has recently tried to get over this difficulty by denying that the chicken tumours are due to a virus. But the cultivation of a virus by Dr. GYE and the success of Mr. BARNARD in rendering the virus visible under the microscope renders this view untenable.

Dr. GYE's work has solved this dilemma in a manner which is as unexpected as it is convincing. He shows that there is both an extrinsic and an intrinsic factor concerned in the ætiology of cancer. The extrinsic factor is a virus common to all neoplasms. By itself it is incapable of producing a neoplasm. To do that it requires the intrinsic factor—a substance produced by the cells which enables the virus to attack the cells. The virus can be cultivated. The intrinsic factor which so far has been demonstrated only in different tumours is presumably produced by the cells in the course of chronic irritation. The intrinsic factor varies from tissue to tissue and from tumour to tumour. In such tumours as those observed by ROUS it is abundant and very resistant, so that it persists even in an extract made without special precautions; in most other tumours it is present in small amounts and very labile, so that special anaerobic conditions are necessary to preserve it and to demonstrate its existence. This apparently fundamental difference between the ROUS tumours and other tumours is, therefore, merely the manifestation of different degrees of lability of this specific substance. Experimental cancer research has brought to light a number of other facts, the explanation of which has hitherto presented great difficulties. As an instance we may mention the development of sarcomata in the course of the experimental propagation of certain carcinomata as described by EHRLICH, by HAALAND, and by RUSSELL. For all these difficulties Dr. GYE's work offers a satisfying solution—a good test of the value of the conception which he has formulated of the ætiology of cancer. As already stated, Dr. GYE has succeeded in producing a sarcoma with the virus obtained from a carcinoma. The reverse result has not yet been attained—nor has it ever been observed to occur spontaneously in the course of the experimental propagation of sarcomata.

The work of Dr. GYE is the outcome of an investigation on ultramicroscopic viruses instituted by the Medical Research Council. A group of men were appointed to work in different special directions, a member of which, Dr. P. P. LAIDLAW, gave invaluable help towards finding the direction in which new researches might most profitably proceed. The Medical Research Council is to be congratulated on having secured the services of Dr. GYE and Mr. BARNARD, whose successful work has opened up a new chapter in the investigation of disease. We have stated at the outset that we hold Dr. GYE's work to be a solution of the central problem of cancer. But it is more than that. Dr. GYE has also evolved a technique for cultivating ultramicroscopic viruses and a method of testing for their presence. The observation that a virus by itself is non-pathogenic, and requires an accessory substance

to produce a specific disease may prove to be of the greatest importance in the further study of the diseases due to these viruses. As Dr. GYE points out, the fact that an organism can be non-pathogenic by itself and manifests its specific pathogenicity only in the presence of some accessory factor is not peculiar to the virus of cancer. A few years ago Dr. CRAMER and Dr. GYE showed that such a phenomenon plays a part in many well-known bacterial infections. Thus the bacteria of gas gangrene by themselves are non-pathogenic. But when certain simple chemical substances are also injected, such as calcium chloride or colloidal silicic acid, a slight but specific lesion is produced in the tissues, and then the specific infection is elicited and kills the animal. They called this phenomenon "defence rupture" or "kataphylaxis," and pointed out that it applied to other bacterial infections. For instance it holds good for tetanus, and even the course of streptococcal infections may be profoundly altered by the presence of such kataphylactic substances. GYE and KETTLE found this phenomenon to apply also to tuberculous infections. The phenomenon is obviously of considerable importance in determining both the onset and what is vaguely called the virulence of bacterial infections, and it is curious that the importance of these observations was not generally recognised by bacteriologists. But a few months ago Dr. COLEY—the New York surgeon—referred to these observations of CRAMER and GYE in a symposium on cancer, in which he presented the evidence in favour of the parasitic theory of cancer. COLEY suggested that the cancer parasite postulated by him required kataphylaxis to attack the cells so as to produce the cancer lesion—probably the only correct guess that has been made in the voluminous literature of cancer theories.

All this work has cleared the way for a rapid advance in the investigation of cancer along entirely new but clearly defined lines. A host of new questions has arisen, and we have no doubt that by answering them the attack on the cancer problem, which has hitherto baffled medical science, will be brought to a successful conclusion. But there is a far wider outlook than this. The new technical methods now made available will be applicable to research along a whole enormous front. Diseases like measles, small-pox and encephalitis, foot-and-mouth disease and dogs' distemper, may yield their secrets to workers armed with these new weapons.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The thirty-seventh meeting of the Commission was held at the Home Office on July 7th, Lord Lawrence of Kingsgate and later Sir Arthur Worley in the chair. A statement by the Government Actuary dealing with the results of the second valuation of approved societies so far as completed was considered by the Commission. Evidence was submitted by the Stepney Borough Council, represented by Councillor J. H. Barnby, as to the payment of contributions in respect of men casually employed on relief works; by the Sons of Temperance Friendly Society, represented by Mr. T. W. Huntley, as to various matters of approved society administration; by the Association of Poor-law Unions, represented by Mr. R. A. Leach, as to the relations of Poor-law relief to Health Insurance benefits. Thereafter Mr. W. J. Braithwaite gave evidence on the question of the case-value method of remuneration of panel practitioners. The thirty-eighth meeting of the Commission was held at the Home Office on July 9th, when evidence was submitted on behalf of the National Association of Trade Union Approved Societies by Mr. F. Kershaw, President; Mr. E. Corbey, Secretary; and Mr. G. W. Canter, ex-President of the Association, and Mr. G. P. Blizard covering the whole range of the Health Insurance Scheme, in particular the need for expanding and unifying the arrangements of the various health services.

Annotations.

"Ne quid nimis."

CURRENT MEDICAL POLITICS.

THE Representative Meeting of the British Medical Association, now in session at Bath, has before it some important matters of medical policy. A memorandum on Coroners' Law and Death Certification sets out the present anomalies and the difficulties in which the practitioner may be placed. The suggested remedy is one which has already been embodied in a Bill which failed to receive Parliamentary assent two years ago. Therein it was proposed to have two certificate forms, one of which would certify the fact of death or stillbirth and would be signed by the medical practitioner, after viewing the body, within 24 hours after the decease has been notified to him. In addition to this he would forward direct to the registrar a further report as to the cause of death, including any scientific data considered desirable. These reports would be filed in a separate register not open to inspection except by a coroner, a medical officer of health, or superior police officer. Should the certificate of the fact of death not conform with the statutory type the registrar would inform the coroner. The suggested fee for death certification is 5s., with a mileage bonus of 2s. per mile. No doubt the Representative Meeting is giving attention to the additional burden which this procedure would lay upon the practitioner, and to the question whether it is desirable to withhold from relatives the certified cause of death. The revised report of the Ethical Committee of the Association on the subject of Indirect Methods of Advertising will come up for approval, which carries with it the possibility of issuing a ruling which should guide the practitioner who wishes to publish articles in the lay press without overstepping the bounds of professional liberty. The Special Committee appointed to consider puerperal morbidity and mortality may have some practical contribution to make to another problem which touches the practitioner very closely. The representation of the general practitioner on the General Medical Council will be raised by a Division which is not satisfied with the present status. Prolonged discussion is also probable on the Hospitals Policy of the Association. The principle of contributory schemes and staff funds has been accepted by the Representative Body as a whole, but there is still much difference of opinion as to whether contributions by employers or employees should be regarded as contributions for services rendered or to be rendered. As a result of an instruction given at the Bradford meeting, the Council of the Association is recommending to the Representative Body the establishment of a B.M.A. Charities Committee, the duty of which it would be to direct the attention of members to the need for contributions and to manage a "Charities Trust Fund," the moneys to be distributed among the existing medical benevolent organisations. There is ample matter on the agenda to fill up the four days allotted.

ASCARIS LUMBRICOIDES IN HERTFORDSHIRE.

ASCARIASIS is generally considered to be rare in this country, but in 1923 the attention of the Ministry of Health was drawn to the prevalence of this nematode in the small hamlet of St. Margaret's, Hertfordshire. The village consists of ten cottages with a population of some 60 persons, mostly children, and the source of the infestation appeared to be the water-supply, a pump with disordered valves. The report¹ of the Ministry has now been published by Dr. S. Monckton

¹ Reports on Public Health Medical Subjects, No. 31. H.M. Stationery Office. 6d.

Copeman, together with an abstract bibliography of the subject and a tabular review of the symptoms presented by 158 cases of ascariasis under the observation of Dr. F. C. Wellman, of Angola. This is interesting to compare with a similar analysis published some years ago by Mr. W. H. Haw, of Cape Colony.² Prof. R. T. Leiper's investigation of ankylostomiasis in Cornish miners revealed a concomitant infection with ascaris in 14.7 per cent., and the general experience of practitioners in Cornwall is that ascariasis is by no means uncommon there. Records at St. Margaret's indicate that the inhabitants have been almost universally affected for several generations and include the story of the infestation of an infant said to be totally breast-fed and of a child who died after vomiting between 60 and 70 worms. It was this fatal case that drew the attention of the medical officer of health to the condition of the hamlet. The endemic prevalence is ascribed to the keeping of pigs and the use of material from the cottage earth-closets and pig-sties as manure. It is being combated by measures of personal hygiene and the repair of the pump. The report includes a survey of the biology and pathology of the worm and a chapter on treatment. Clinically it is agreed that santonin is the most efficient drug, though opinion differs as to whether it acts by killing the worms or merely by lowering their vitality so that they are unable to resist the peristaltic waves. As was pointed out in *THE LANCET* recently,³ the answer to this problem may lie in an appreciation of the comparative insolubility of santonin.

THE FATAL ILLNESS OF THE EMPEROR FREDERICK: LARYNGOFISSURE THEN AND NOW.

IN an obituary notice of the late Mr. Mark Hovell, which appeared in *THE LANCET* last week, the controversy was recalled which raged over the illness and death of the German Crown Prince, later the Emperor Frederick-III., for Mr. Hovell was resident at the palace during the latter part of the illness as deputy to Sir Morell Mackenzie, the Prince's chosen adviser. Looked at from the present distance of time the controversy seems to have been largely unnecessary, and to have been due in great measure to jealousy of a foreign colleague in control of an august person. Sir Morell Mackenzie occupied an invidious position, and, although perhaps no one now can know the details of the intrigues which surrounded the conduct of the case, it appears that he was actuated by a single-minded devotion to the medical welfare of his patient. It was a difficult laryngeal case for diagnosis. When Mackenzie first examined the patient in May, 1887, there was a warty swelling over the left vocal process which was suggestive, but not pathognomonic, of cancer. He refused to give an opinion, but removed endolaryngeally on several occasions portions of the growth for microscopical examination. On each occasion Prof. Virchow reported that these specimens, which included the deep parts, showed no evidence of cancer, and he characterised the lesion as a "pachydermia verrucosa." It was not until after the lapse of six months, during which time the Crown Prince attended Queen Victoria's Jubilee and spent some weeks in Britain, that the laryngoscopic appearance became more highly suggestive of malignant disease. In November a subglottic growth was visible on both sides of the larynx; on Feb. 9th, 1888, tracheotomy was performed by Dr. Bramann. The patient died on June 13th, having become Emperor on the death of his father on March 9th. There had been much irritation of the trachea from the tubes, and considerable sloughing of the wound, which Mackenzie believed might have been avoided had his advice on the type of tube been followed. His management of the case appears to have been correct in the light of the

results, up to that time, of the treatment of laryngeal cancer by laryngofissure and by laryngectomy. It is possible that, with our present knowledge, a correct diagnosis would have been made in the early stage of the disease, and that a laryngofissure might have been successful, though tumours affecting the vocal process are not particularly favourable objects for operative interference. But with Virchow's reports before him Mackenzie could not have been expected to advocate external operation; when the bilateral subglottic tumours appeared in November nothing but a total laryngectomy would have been possible, and this the patient had already refused. In his book, "Frederick the Noble," Mackenzie gives tables of the results of the various laryngeal operations to that time; 22 cases of laryngofissure had been collected with two successes and an immediate mortality of 6, or 27.2 per cent. The work of Butlin and Semon subsequently developed this operation, so that an intrinsic laryngeal cancer is perhaps as favourable for removal as any malignant growth, and recent statistics show an operative mortality of 6 per cent. and freedom from recurrence for three or more years of 47 per cent. In passing judgment on Mackenzie the accepted teaching of the day must be remembered; indeed, this should always be in our minds when reviewing the procedures of our predecessors.

MECKEL'S DIVERTICULUM.

OF developmental anomalies of the omphalo-mesenteric duct Meckel's diverticulum is probably the most common. The diverticulum, as such, produces no symptoms, but is liable to cause intestinal obstruction, either by becoming twisted, the torsion involving the bowel from which the diverticulum springs or by snaring a loop of bowel, the apex of the diverticulum being attached, either to the umbilicus congenitally, or to some portion of peritoneum by acquired adhesions. Opinions differ as to whether a healthy Meckel's diverticulum, discovered accidentally during operation, should be removed. Owing to its free opening into the ileum acute inflammation of the diverticulum is rare, but, when it occurs, has a high mortality. Preoperative diagnosis of a Meckel's diverticulum as the cause of an "acute abdomen" is usually impossible. Dr. F. Christopher has recorded¹ a case from St. Luke's Hospital, Chicago, of diverticulitis with perforation. A man, aged 47, had been ill for two weeks with pain in the left lower abdomen, accompanied by fever and rigors. In the left iliac fossa was a very tender elliptical tumour, 4 by 8 in., slightly movable. Leucocytosis 12,800. Coeliotomy revealed some gas and pus, and a tumour composed of adherent omentum enveloping a necrotic diverticulum. The diverticulum was excised and the ileum was sutured. Recovery ensued after a stormy convalescence. On the fifth day a fecal fistula developed and persisted, though diminishing in size, up to the time of the report, 19 weeks after operation.

RADIUM TREATMENT OF THE UTERUS.

THE annual report² on the treatment of patients at University College Hospital with the radium allotted by the Medical Research Council contains, in addition to the work of 1924, a summary of the results of the last three and a half years. The hospital has the loan of 372 mg. of radium sulphate which is put up in 11 containers of 0.5 mm. thickness of platinum. Dr. R. T. Lewis refers specially to the treatment of carcinoma of the cervix and menorrhagia. In regard to the former he repeats a warning which has been made elsewhere, and which cannot be too strongly impressed, when he refers to the "stimulant effect of inadequate radiation, causing generalised carcinomatosis." More and more is the fact brought out that if the operator has an inadequate amount of radium

² *THE LANCET*, 1904, i., 1722.

³ *THE LANCET*, 1924, ii., 124.

¹ *International Clinics*, Series xxxv., vol. i., p. 67.

² London: John Bale, Sons and Danielsson, Ltd. 1925.

salt at his disposal he would do better to leave a case alone than merely to stimulate its growth in place of administering the lethal dose it requires. This specially applies to the inadequate application of radium plates externally for the treatment of carcinoma of the cervix. Dr. Lewis states definitely: "Carcinoma of the cervix adequately treated [with radium] disappears entirely," so that the operator should select for treatment those cases for which his supply of radium is adequate to ensure a prospect of cure or at least retardation of the growth. A valuable section of the report describes the results of treatment by radium of menorrhagia. Out of one group of 32 cases of menopause hæmorrhage treated, 27 are now well in every way. In cases of essential menorrhagia in young women with no signs of pelvic disease encouraging results were procured, and cases were cured after treatment by drugs and curettage had failed. Menorrhagia due to fibroids also responded well to radium. One container holding from 100 to 150 mg. of radium sulphate, placed inside the uterus, reduced large fibroids in a dramatic fashion. At University College Hospital it does not appear to be the practice, as it is at the London Radium Institute, to "cross-fire" these fibroids with heavy plating from outside. The whole report makes encouraging reading.

THE BATEMAN APPEAL.

It has been decided to close this Fund, and we thank those of our readers who supported the appeal. The money subscribed has been of the greatest possible service to Dr. Bateman, though the total was less than we had anticipated. The fact that Dr. Bateman had joined no society for coöperative defence influenced many, as we know by their letters, to withhold support, so that it is evident from the outcome of this appeal that the medical profession at large is not prepared to sympathise with those of its members who neglect the obvious precaution of insurance.

SHIPS DISABLED BY DENGUE.

WHEN the sloop, *Antarès*, of the French Navy, was lying at Bahia¹ on Oct. 21st, 1923, 52 of her ship's company of 99 were on the sick-list with dengue. She had in all 71 cases, of whom 43 were sent to hospital. Though only one died the epidemic very seriously impaired the efficiency of the ship, since she was immobilised for two months and 25 men had to be invalided home. She had lain at Dakar, in Senegal, the westmost port of Africa, from Sept. 29th to Oct. 7th, three of the days in dry dock. There was at that time no report of dengue in the colony, only of influenza; mosquitoes were reported "numerous," as is usual at that port. The *Ango*, which had preceded her in the dry dock, had, on arrival at Havre, 40 out of a crew of 56 sick, and in all 55 were received into hospital. The malady was never officially given a name at Havre, but people spoke of paludism, bilious fever, and even of scarlatina, owing to the eruption. *Antarès* left Dakar on Oct. 7th for Bahia, crossed the line on the 11th with the usual celebrations, the ship's company alert and well, though some were bothered with headaches. On the 13th dengue began to show itself quite clearly in 11 cases with frontal headache, suffused eyes, pains in joints without redness or swelling, vomiting, pyrexia, and a fleeting rash; no coryza or sore-throat. Many recovered in two or three days, but there were 25 sick when the ship arrived at Bahia on the 15th. Here the numbers rose rapidly; on the 23rd 35 cases were sent to hospital and others later, where they improved so rapidly that 38 convalescents were returned in the next ten days. The characteristic polymorph leucopenia of dengue was noted in hospital. On Nov. 5th, however, all the five still in hospital, and most of those sent back, relapsed. There were no new men attacked, and those

relapsing were far more ill than in the first period, the complications being jaundice, with tenderness and enlargement of the liver, and obstinate constipation. Convalescence was painfully prolonged with great muscular weakness and pyrexia on exertion. No treatment was specially successful, though antipyrin eased pain. Milk caused vomiting, but diluents were readily taken. The disease is ascribed by Dr. Bideau, medical officer of the ship, to a culex, but since he wrote *Aedes argenteus* (*Stegomyia fasciata* in old terminology) is generally incriminated. The insect is called *A. egypti* by Siler and his fellow workers, who give the incubation periods as 11 days in the mosquito and four to ten days in the men attacked. No mosquitoes were seen in the ship after the 10th, but cases appeared between the 13th and 28th, so it is difficult to understand how the infection spread, if there is no infection from man to man, which Dr. Bideau suggests as concurrently possible. In any case this history emphasises the need for mosquito protection of ships' companies in tropical harbours and especially when in dry docks, particularly in ports, like Dakar, known to be specially plagued with mosquitoes. The recent United States investigators of dengue, Siler and his fellow workers² insist on the epidemiological relation of dengue and yellow fever, their distribution by a common carrier, and suggest that each is caused by a filterable virus. Dr. I. J. Bideau, Médecin de 1re classe (Surgeon Lieutenant-Comdr.), the medical officer of the ship, had an anxious experience, but his careful report on the outbreak, with its detailed account of cases, have at least won for him the Prix de Médecine Navale for 1925.

PROFESSIONAL X RAY DERMATOSES.

Dr. H. N. Cole, of Cleveland, believes³ that there are many more cases of radio-dermatitis in professional men, nurses, technicians, and orderlies than is commonly suspected, and it is doubtless with a view to their recognition and treatment before the symptoms have progressed too far that the author has given himself the trouble of collecting the bibliography since 1896 (the X rays were discovered in 1895), describing the symptoms and detailing the pathology and course of Rontgen ray injury as it is seen on the skin. The results are cumulative, but may be postponed for many months or years. In the main they are degenerative, especially in the corium, where sweat and pilosebaceous glands soon tend to disappear. Later the fibrous tissue becomes hyaline, and stains badly with Mallory's phospho-tungstic acid connective tissue stain. Vacuolation and distension of plain muscle-cells may eventually lead to their complete destruction. The most important and far-reaching changes are those noted in the blood-vessels, both arteries and veins. The smaller vessels are obliterated by swelling of the endothelial cells, and thickening of the intima. Elastic fibrils are broken up and absorbed, and may be replaced by fibrous tissue, while the middle coats of arteries become thickened and aid in the general sclerosis of the vascular supply. The newly formed capillaries (telangiectases), so often a striking clinical feature of an old-time X ray injury, are regarded by Dr. Cole as the fruitless attempt of a reparative process to supply a new circulation to avascular tissues, in which as a secondary effect focal necroses are so commonly seen. In the epidermis of an advanced case there are the usual evidences of chronic inflammation, with hyperkeratosis and exfoliation, hyperplasia with acanthosis of the prickle-cell layers, and in serious cases, changes in the basal cell layer (stratum germinativum) with occasional gaps in its continuity. "Perles" of epidermal cells in the upper corium may herald commencing malignant changes. Further study on these lines would certainly be of value in view of the great present-day vogue in radio-diagnosis and therapy.

¹ Jour. Amer. Med. Assoc., May 18th, 1925.

² Journal American Medical Association, 1925, lxxiv., 865.

³ Arch. de Médecine Navales, April, 1925.

JUVENILE MORTALITY IN SWINDON.

Dr. Dunstan Brewer, in his latest annual report, states that the real causes of death can only be ascertained by comparing the life-histories of those who die with the life-histories of the survivors, and thus discovering the manner in which adverse factors operate. He is, therefore, compiling the life-histories of Swindon residents who die before reaching adolescence. He gives, however, with the information already at his disposal, an interesting analysis of the deaths of children during 1924.

Neonatal Deaths.—Of the 29 neonatal deaths six were from congenital malformations and theoretically unpreventable, and 17 could not be satisfactorily explained, so that we cannot say whether they were theoretically saveable or not. Of the remaining six, which were satisfactorily explained, four at least were theoretically preventable, three being from congenital syphilis and one from ill-feeding.

Deaths from End of First Month to End of First Year.—These may be divided into those who attended the clinics and whose life-history is known and those about whom information was only obtained after death. It should be explained that the social position of Swindonians is remarkably level, there being few citizens at the top or bottom of the social scale. The so-called residential class is very small and is not fertile. It therefore comes about that 90 per cent. of the children attend the clinics. Among the babies who attended the clinic 12 died, three being breast-fed, nine artificially fed. Of the three breast-fed, one died from an operation for intussusception, one from a congenital blood disease, and one from pneumonia following measles. Of the nine artificially fed four died from ill-feeding, and from respiratory disease following measles or whooping-cough, ill-feeding being a contributory cause of death. Of the 17 children whose life-history was not known five were said to have been breast-fed and 12 artificially fed. Of these breast-fed infants one died from injury, one from syphilis, one from pneumonia, one from bronchitis, and one from pyæmia. Of the artificially-fed "non-clinic" infants, seven apparently died from ill-feeding alone, four from pneumonia following whooping-cough, and one from congenital heart disease. All the clinic children who died were legitimate. Of the others, two were illegitimate and the rest legitimate. The fact that the 90 per cent. of infants who attended the clinics furnished 12 deaths while the 10 per cent. who did not attend furnished 17 deaths indicates that the section of the population for whom attendance at the clinics is most necessary do not use them.

Deaths between 1 and 2 Years of Age.—Fourteen such deaths were registered, 10 being among clinic children. Of the ten clinic children whose history was known five had been breast-fed. Of these, one died from scalds, one from sarcoma of the kidney, and three from pneumonia or bronchitis. Of the five artificially-fed clinic children one died from acute nephritis, one from tuberculous meningitis, three from pneumonia following measles or whooping-cough. Of the four non-clinic children whose history is not properly known, one died from tuberculous meningitis, one from ill-feeding, and two from pneumonia following whooping-cough.

Deaths between the Second and Fifth Year.—Fourteen such deaths occurred, seven among clinic children. Of these latter five were breast and two artificially-fed. Of the breast-fed, one died from scarlet fever, three from pneumonia following measles, and one from tuberculous meningitis. Of the two artificially-fed clinic children one died from appendicitis and one from rickets. Of the seven non-clinic children one died from scalds, one from rheumatic heart disease, one from epilepsy, and four from pneumonia following measles or whooping-cough.

Deaths of Children Aged 5 to 10.—Five such occurred, three being among clinic children. Of the latter, who were all artificially fed in infancy, one died from cerebral tumour, one from rheumatic fever, and one from primary pneumonia. Of the two non-clinic children, one died from epilepsy and one from influenza.

Deaths of Children Aged 10 to 17.—Twelve such children died, but their life-history is not perfectly known. Four died from tuberculosis of the lung, one from tuberculous meningitis, and one from tuberculosis of the spine: one from heart disease, one from pneumonia, one from actinomycosis, one from Bright's disease, one from epilepsy, and one was run over.

It is perfectly obvious from Dr. Brewer's figures that the 10 per cent. of children who do not attend the clinic furnish an undue proportion of deaths up to the age of 10. Dr. Brewer does not think that the severity of the attack furnishes the explanation why

one child dies from a disease and another does not, but he thinks the life-history will furnish a sufficient explanation in the case of many diseases such as whooping-cough, pneumonia, and appendicitis. Dr. Brewer goes on to consider the causation of the 26 stillbirths which occurred in Swindon during 1924. No adequate reason is forthcoming for 14. In 12 cases there was some evidence available, but a real explanation only in the case of five which occurred in the maternity home. In the case of one of these five, the foetus was dead before admission owing to contracted pelvis; in the case of two death was due to asphyxia caused by the impaction of the head in breech presentations; another was due to placenta prævia, and the fifth was a premature puny infant, theoretically unsaveable. Of the seven other stillbirths in the case of which some evidence was available, two could be put down to congenital syphilis, one to a toxæmia of pregnancy, one to pneumonia in the mother, and one to an obscure disease of the mother. The two remaining cases were due to complications of delivery, which might have been foreseen and prevented. Of the 26 stillbirths five only had received any kind of antenatal care and all were legitimate. It will be noted that a very large proportion of the 12 stillbirths, about which there was any real evidence as to cause, were theoretically preventable by antenatal work. Swindon has a population of 56,000, about 1000 births annually, and an infant mortality of under 60 for the last three years, but Dr. Brewer's investigations suggest that a more complete scheme (which he outlines in his report) is capable of effecting very great reductions both in the infant mortality-rate and in the death-rates during the year immediately succeeding infancy.

BIRTH NOTIFICATION.

THE early working of the Notification of Births Act of 1907 was intimately bound up with the life of Mr. Benjamin Broadbent, of Huddersfield, whose death was recorded in our columns a fortnight ago. Some interest attaches to the origin of this Act which was the beginning of a general infant welfare campaign. In December, 1904, the medical officer of health for Huddersfield, Dr. S. G. Moore, submitted to his sanitary authority a preliminary report on the measures employed in France and Germany for the protection of infants. In the course of Dr. Moore's inquiries he learned of a small commune in the Midi, Villiers-le-Duc, where for ten years not a single baby had died during its first year of life. To apply similar methods in Huddersfield required a foreknowledge of the existence of the infants to be saved. At that time the books of the Registrar of Births and Deaths afforded the only means of learning this essential fact, and that indirectly after a delay it might be of six weeks. Not infrequently the medical officer saw the names of newly born infants in the death returns of the same date as the birth returns. With the support of the Health Committee, of which Mr. Broadbent was then chairman, Dr. Moore obtained from the sanitary authority sanction for the payment of one shilling to any person who notified to him within 24 hours the birth of an infant. In the following year authority was obtained in a local Act to require the father of a child, if in residence at the house where the birth took place, to make the notification within 36 hours. Failing the father, any person who was in attendance on the mother at the time of birth or within six hours thereafter was required to notify.

A year later Mr. John Burns, President of the Local Government Board, lent powerful support to the Huddersfield clause, and the Notification of Births Act was passed; at first adoptive, in 1915 it was made compulsory. In the work leading up to this conclusion Mr. Broadbent played an active and enthusiastic part, against opposition which was not always good-humoured. An account of the Huddersfield scheme is set out in a small brochure which is signed jointly by

B. Broadbent and S. G. Moore. Immediately upon receipt of the notification of birth, upon the same day in all cases, a visit is made by a medical woman, whose responsibility is to ensure that no infant shall perish as the result of ignorance on the part of the mother. After her visit or visits the case is handed over to a voluntary association of ladies who have simply to call from time to time in a friendly way. If they find that the baby is not flourishing they send a post-card to the medical officer of health, whereupon the assistant medical officer revisits and if necessary calls in the family doctor. In no case is medical treatment provided by a member of the staff of the public health department.

There can be little doubt that the movement has preserved thousands of human lives during the last 20 years, as well as greatly reducing crippling, blindness, and ill-health. The Huddersfield records are typical of what the Notification of Births Act has made possible throughout the country. The mean infant mortality figure for that borough prior to 1907, the year when the Huddersfield scheme came into full operation, was 155. For the last few years it has averaged about one-half of that figure, and in some single years it has approached one-third. Coincidentally the maternal mortality among those whose pregnancies have been made known to the medical officer of health has fallen from 5-6 per 1000 to 2.5, while the neonatal mortality—deaths under one month—has also been materially reduced. In Huddersfield at the present time there is not a single child of school age blind as the result of ophthalmia neonatorum. There will still remain a doubt in the minds of a section of the medical profession as to the exact part played by "direct measures," such as have been here described, in reducing infant mortality as contrasted with the indirect effects of better general education and the improving of a generation of mothers who had the benefit of the Act of 1870. Bristol has been cited as an example of a city where the decline in the infant mortality-rate was as striking as that of Huddersfield in the absence of direct measures. No doubt the latter were both more necessary and more potent in a town like Huddersfield, where many mothers work in factories. However that may be, Benjamin Broadbent will go down to posterity as a pioneer of the child welfare movement, which marked the first quarter of the twentieth century, and as a friend of humanity at its most helpless age.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. P. H. Henderson to be Bt.-Col.

ARMY DENTAL CORPS.

Temp. Capt. J. L. Garrard, from Gen. List., to be Capt.

REGULAR ARMY RESERVE OF OFFICERS.

Maj.-Gen. Sir Alfred P. Blenkinsop, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Capt. J. A. Charles, from R.A.M.C., to be Capt.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. W. S. Dawson to be Capt.

MILITIA.

Maj. R. M. Beath relinquishes his commn. and retains the rank of Maj.

Capt. A. F. L. Shields resigns his commn.

TERRITORIAL ARMY.

Surg.-Lt. W. S. O'Loughlin (late Royal Navy) to be Capt.

Capt. H. Pinto-Leite to be Maj. (Prov.).

Capt. A. F. L. Shields (late R.A.M.C. Militia) to be Capt.

2nd Lt. H. W. M. Williams (late South Wales Borderers) to be Lt.

INDIAN MEDICAL SERVICE.

Lt. G. H. Fitzgerald to be Capt (Prov.).

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXI.

TREATMENT OF EXTERNAL OTITIS AND FURUNCULOSIS OF THE EXTERNAL AUDITORY MEATUS.

INFLAMMATORY implications of the pinna and fibro-cartilaginous external ear are accompanied by symptoms and local manifestations, sometimes almost indistinguishable from those which arise from extensions of primary middle-ear suppurative infection to the cutaneous tissues behind the auricle. Since a mistake may have distressing consequences where the diagnosis is not obvious after careful examination the surgeon should act as if the more serious condition were present, provided always that he feels assured of his skill in the necessary surgical technique; no harm could come from doing a simple mastoidotomy when only the external ear is inflamed, but most severe complications may follow the treatment of mastoid disease on the lines of an external otitis. In practice, however, it is rare for a surgeon in daily contact with these affections to have much difficulty in making the differential diagnosis. The swelling and tenderness has been superficial throughout in external otitis, and has only recently become so in suppurative mastoiditis. In the last-named condition the shape of the external meatus is similar to that of the sound ear, whilst in external otitis it is narrowed, slit-like, red, and very sensitive to touch with the speculum or a probe. In mastoiditis the drum and middle ear show evidence of inflammation, perforation of the membrane, or discharge of pus, whilst in external otitis the drum may be absolutely normal, except in patients who give a history of old middle-ear suppuration. The discharge from the ear in mastoiditis is stringy and sticky, owing to the presence of mucus from the inflamed middle ear, this property being absent from the pus of furuncular origin. Tenderness to touch is localised to movement of the pinna and external meatal tube when they alone are inflamed, and to the tissues over the surface of the mastoid when the bone beneath is involved. Deafness and tinnitus may be common to both conditions, but pain, which is often the dominant symptom, may be even more pronounced in the less grave of the two affections, because the close attachment of the skin to the cartilaginous tube affords little accommodation for inflammatory oedema; moreover, the pressure is rendered still more intense by the unyielding bony walls if the furuncle is deep in the meatus.

Furunculosis is by far the commonest type of external otitis; the differential diagnosis of the other forms met with—diffuse otitis and acute recurring eczema—is much easier.

Diffuse otitis does not tend to point like a furuncle; the inflammatory induration is not definitely circumscribed, but resembles a cellulitis. It may result from a skin abrasion, infection by staphylococci or streptococci, but is occasionally due to the *Bacillus pyocyaneus*, the latter form being much commoner in parts of the continent than in this country.

Acute recurring eczema is not usually included under the heading of otitis externa in text-books, but the acuteness of its onset, the distress it causes, and the frequency with which unresolved patches of eczema in the region of the external meatal orifice act as the starting-point of furuncular and diffuse inflammation, entitles it, in my opinion, to be so included.

Furunculosis.

The treatment of external otitis of furuncular origin must necessarily vary with the stage of the affection. In all cases, to begin with, 3 gr. of calomel should be given at night followed by a saline in the morning. If the patient is seen very early, before inflammatory infiltration is pronounced, touching the point of infection with pure carbolic may cause the furuncle to abort, but care must be taken to prevent the carbolic flowing beyond the exact spot, otherwise an area of skin may be denuded of epithelium and a further infection result. If the exact point cannot be discovered, carbolic oil should be applied with a piece of wool to the entire meatus twice daily. It serves two purposes, the first being to render practically inactive any organism present in the meatus at the time, and the second to act similarly on any fresh organisms entering from without or from pus escaping when the furuncle matures. In mild cases it is ample treatment and prevents the tendency to recurrences. Excessive moisture in the meatus leads to maceration of the epithelium, and as this facilitates reinfection the amount of liquid left behind should be reduced to a minimum, whether it be oil, lotion, or drops. When there is much inflammatory induration present, accompanied by pain, fomentations give considerable relief, and if persisted in for 24 hours will often suffice to bring the furuncle to maturity and spontaneous rupture. It is a moot point whether fomentations favour the occurrence of furuncular crops or not. If too moist they may do so by macerating the epithelium, but probably not otherwise. If carbolic oil has been previously used it should be cleaned off the skin as carefully as possible or the application of heat over it may result in a blister. The fomentation by itself will produce a blister if too hot, and is then probably responsible for reinfection and some discredit to an excellent method of treatment. Dry sterile wool in the meatus, concha, and around the pinna, over which a rubber hot water bottle is applied, is very comforting.

Advanced Cases.—When, however, the induration is considerable with some surrounding oedema, the progress of the case is slow, and the pain persists, free incision through the furuncle offers the best prospect of early success. An attempt should be made to render the meatus as sterile as possible by using hydrogen peroxide and syringing with warm boracic lotion; under a short general anaesthesia, a short, straight tenotomy knife is then passed into the passage, deep to the furuncle, and carried outwards through its centre and down to the base. It is most important to cut deeply, otherwise the inflammatory tension and pain will persist. Syringe again with the warm lotion, dry out, and dress with a strip of sterile ribbon gauze partially soaked in bipp. The first dressing may remain for 48 hours, but should be changed daily afterwards. In cases where the furuncle has opened spontaneously a daily dressing of gauze or bipp is satisfactory. As lotions are frequently used in treating meatal inflammatory infections it is well to emphasise the risk that maceration of the epithelium may give rise to reinfection. All excessive moisture tends to macerate the skin, but mercurial or carbolic lotions are particularly liable to do so, especially the former.

Recurrences of furunculosis, in my opinion, are often due to the reinfection of denuded areas of skin, resulting either from the inflammatory process or the maceration of epithelium by some fault of the medicament or technique, which with care may be guarded against. However, despite every known precaution, recurrences will take place, when vaccine therapy promises the most effective line of attack. Autogenous vaccines, if obtainable, are the best, but if they are not available stock vaccines are worth a trial. I have seen excellent results from their use in some cases and from such small dosage as 50, 100, and 200 million staphylococci (*pyogenes aureus*) in successive weekly doses.

Diffuse Otitis.

Diffuse otitis is much less common than the furuncular form and is usually an accompaniment of an existing middle-ear suppuration. The treatment follows the same lines as that indicated already in the inflammatory indurations of furunculosis—namely, a sterile drainage-wick in the ear, fomentations, and, if suppuration occurs, surgical incision under general anaesthesia. In the form due to *Bacillus pyocyaneus* a perichondritis is present, but it never suppurates. It may last five or six weeks and tends to recur through reinfection, probably by the patient scratching the meatal orifice with the finger-nail. The organisms usually have their habitat in the axillae and groins of persons of indifferent hygienic habits and surroundings. Frequent bathing and the application of a weak biniodide of mercury lotion to the groins and axillae with the daily use of 3 per cent. silver nitrate drops in the ear is the best treatment. As hydrogen peroxide is now so commonly prescribed in the treatment of ear affections, it is interesting to note that if this is used in external otitis of pyocyaneus origin these organisms will flourish luxuriantly.

Acute Recurring Eczema.

Acute recurring eczema responds well to treatment. During the acute stage Lassar's paste (zinc oxide, pulv. amyl, lanolin and vaseline, each 2 dr.) should be applied on strips of muslin or lint (smooth side) over the pinna and in its folds and on a few inches of half-inch ribbon gauze lightly packed into the external meatus, night and morning. Gauze wick will prove useful as a drain from a middle-ear suppression, should such be present, until the condition of the external skin permits of the local use of lotions and drops. When the eczema has passed into the dry and scaly stage, 10 gr. of salicylic acid should be added to the ounce of Lassar's paste and applied direct to the affected area which may be otherwise left uncovered. As eczema of the pinna is invariably accompanied by seborrhoea of the scalp, which in the opinion of some dermatologists is the starting-point of the infective ear process, the scalp should be shampooed about twice a week, taking care to protect the ear from the water or shampoo liquid used. Soap spirit (sapo-mollis and spirit. vini rect. 2 oz. each) acts well, but much care must be taken to remove all traces of it by repeated rinsings of water. In less acute cases of deep meatal eczema (so often the starting-point of external otitis, diffuse and furuncular) the following method gives excellent results. If there is any loose skin debris about, remove it by gentle syringing or wiping out with wool with a solution of sodium bicarbonate, 2 dr. to the pint of warm water. Dry meatus and fill with a rolled pledget of wool soaked in the following preparation.

R	Ung. hydrarg. nitr. dil.	..	..	1 dr.
	Liq. carbon. deterg...	..	..	10 M.
	Paraff. liq.	..	..	ad 1 oz.

This oily preparation should be brought into intimate contact with the meatal lining by pressing the tragus on to the wool several times. This wool should be removed and a small dry portion placed in the external orifice only.

JOHN F. O'MALLEY, F.R.C.S. Eng.,
Surgeon, Ear, Nose, and Throat Department,
University College Hospital.

ST. MARYLEBONE HOSPITALS LEAGUE.—Mr. Walter Kewley, house governor of the Middlesex Hospital, calls attention to the work of the St. Marylebone Hospitals League, founded in 1922, and urges its imitation elsewhere. The fundamental principles of the League are the recognition of the obligation upon all people to support the hospitals and "appreciation of the fact that medical education, research work, and the training of nurses are primarily their most important functions"—that is to say, if there were no poor the hospitals would still be essential. To the preaching of this doctrine he ascribes the success of the League.

Special Articles.

THE OPENING OF THE NEW BRITISH MEDICAL ASSOCIATION HOUSE.

ON Monday last, July 13th, His Majesty the King opened the new home of the British Medical Association at Tavistock-square, London.

A full hour before the ceremony nearly all the delegates had taken their places in the Great Hall, and the square between the new memorial gates and the magnificent buildings was thronged with the representatives of the medical colleges and the nursing associations, along with visitors whose connexion with

Royal Standard broke from the flagstaff above the central pediment, and the Artists' band played the National Anthem. His Majesty then inspected the guard of honour, commanded by Captain W. Campbell Smith, M.C. The Minister of Health then presented the President of the Association, Mr. J. Basil Hall, of Bradford, and the Chairman of Council, Dr. R. A. Bolam, of Newcastle-on-Tyne; and the Chairman of the Council presented Dr. H. B. Brackenbury (Chairman of the Representative Body of the Association); Mr. N. Bishop Harman (Treasurer of the Association); Sir Donald MacAlister, Bart. (President of the General Medical Council); Sir Humphry Rolleston, Bart. (President of the Royal College of Physicians); Sir John Bland-Sutton, Bart. (President of the Royal College of Surgeons); Lord Dawson of Penn; Sir George Newman (Chief Medical Officer to the Ministry of Health); Sir Edwin Lutyens (the architect of the



Courtyard of the British Medical Association House.

[Topical Press Photo.]

medicine entitled them to the honour of welcoming the King with his medical hosts. The band of the Grenadier Guards was already playing on the circular lawn, and alternated with a hidden string orchestra, also from the Grenadiers, whose music was relayed to the courtyard and the Great Hall by electrical amplifiers. Many visitors occupied a covered stand just outside the gates on the south side. At a quarter to three a guard of honour marched up—the Artists' Rifles—headed by a fife band in silver-grey, and took post along the short approach from Tavistock-square, which was brilliantly decorated with ornamental columns wound with flowers. At five minutes to three His Grace the Archbishop of Canterbury, escorted by the President, Mr. J. Basil Hall, the architect, Sir Edwin Lutyens, and seven of the leaders of the profession in Great Britain, offered prayer and solemnly dedicated the gates to the memory of the 574 members of the Association who gave their lives in the war. His Grace then took the key from the architect and opened the gates. The Guards played the hymn, "O God, our Help" before the dedication and "Abide with Me" as the gates swung open. The ceremony was impressive in its sincerity and restraint.

At ten minutes past three the King and Queen arrived with their attendants, accompanied by Mr. Neville Chamberlain, the Minister of Health. The

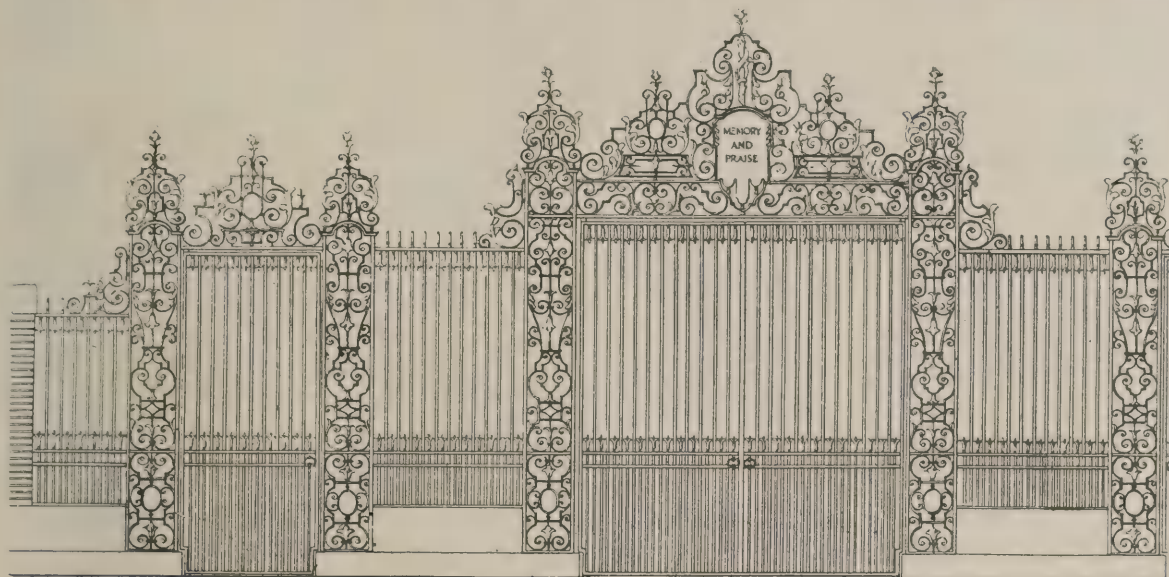
building); and Mr. F. J. Walton (the contractor). Those who had been presented then formed a procession and escorted the King and Queen through the courtyard and the main entrance to the Members' Reception Room. There the Royal visitors met the Reception Committee, and the Chairman of the Council presented Sir Dawson Williams, the Editor of the *British Medical Journal*, and other distinguished medical men and women, as well as the representatives of the workmen who had made the building, and the organising staff who had directed their work.

Meanwhile the Great Hall, with its cheerful white walls and friezes and its peacock-blue columns, held a crowded audience of delegates, who filled floor and gallery, their scarlet gowns and coloured hoods making a brilliant show. The procession mounted the dais to the enthusiastic singing of the National Anthem, and the Chairman of the Council welcomed His Majesty in an address in which he traced the history of the B.M.A. since it was founded by Sir Charles Hastings in 1832, set out its aims and scope, and mentioned its debt of gratitude to the King, who had succeeded his father King Edward as Patron.

His Majesty replied most sympathetically. He said he felt great pride at succeeding his Royal father as the patron of such a noble society, and paid tribute to the splendid work of the B.M.A. in selecting and training recruits to the profession, in criticising and

assisting research, in uniting the medical activities of the country, and in maintaining the very high standards that now governed the practice of medicine. Noble traditions were a priceless possession that must be not only maintained but constantly increased.

Associations. The King and Queen then left the Great Hall and inspected the library, where the King accepted a copy of an illuminated Roll of Honour, the work of Mr. F. G. Hallett. After a tour of the building and grounds Their Majesties returned to the



The Memorial Gates.

He admired especially the promotion of post-graduate study. He warned the profession of their deep responsibility for the general health of the country, and indicated the value of administration in maintaining sanitation in factories and public buildings and places and in preventing epidemic disease, and also of the informal education that the general practitioner can give the lay public in personal health and general hygiene.

He thanked the Association on behalf of the Queen for the reference to her interest in the practice of medicine by women, who were now active in all its branches. He expressed especial pleasure at the harmony he observed to exist between the Medical Association in this country and those in the Great Dominions of the Empire, and was honoured

to welcome the representatives of America, France, Holland, Sweden, Norway, and Denmark.

Sir Edwin Lutyens then presented a master key to His Majesty, who declared the building open, and congratulated the members on their new and dignified home.

The Chairman of the Council then presented the representatives of the Home, Imperial, and Foreign

gates and took leave of the President and representatives of the Committee. Mr. Bishop Harman, the Treasurer, led the cheers as the Royal carriages drove off.

After the ceremony the building was open to inspection by the guests. As at present completed it covers an area of 18,000 square feet and has a total

floor area of 58,000 square feet. It is built in an austere style of red brick with white stone facings, and is approached from Tavistock-square by a short roadway, which will, in due course, be bordered by wings extending out from the Association building. Beneath the Great Hall runs a vestibule connecting the Court of Honour with the entrance in Burton-street, so that cars are able to drive straight through after



The Great Hall.

depositing their passengers. For the owner-driver there is ample covered parking room behind the building. In the centre of the Court of Honour is a circular grass plot curbed with white stone, while the corners are paved with flagstones. The gates are of wrought iron in an eighteenth-century design prepared by Sir Edward Lutyens, painted black, and surmounted by a bronze shield lettered in gold. The

inscriptions on either side of the shield are "Memory and Praise" and "Faithful hath been your warfare."

On either side of the passage-way lie beneath the Great Hall the members' lounge and library, the latter panelled with the rare Spanish mahogany familiar to members in the library at the old building. The former is finished in white and a delicate grey, with narrow black skirting. Beneath these rooms are large basements containing staff dining-rooms and storage offices. In the basement of the north wing is the Hastings Hall, capable of seating 150 persons, decorated in white and pale yellow and lighted by inverted bowls resting on gilt pedestals. Similar in design is the Council room in the basement of the south wing, fitted with tiered seats of green morocco, and lined with oak panelling bearing the names of past holders of the high offices of the Association. On the higher floors are committee rooms, office accommodation for the editorial, finance, and intelligence departments, and the printing offices.

If this ceremony is an omen of the future of the Association, no one need fear for British medicine. In its dignified brevity and order it splendidly expressed the unity and purpose of the B.M.A. They have set themselves a high standard, but no one can doubt that they will fulfil it.

BRITISH MEDICAL ASSOCIATION: ANNUAL MEETING AT BATH.

PROGRAMME OF THE SCIENTIFIC SECTIONS.

THESE sections will meet from 10 A.M. to 1 P.M. on Wednesday, Thursday, and Friday, July 22nd, 23rd, and 24th, for papers and discussions, and it is hoped that laboratory and clinical demonstrations will be arranged for the afternoons. The following sections will meet on each of the three days:—

Medicine.

President: Lord Dawson. Vice-Presidents: Dr. E. J. Cave, Dr. T. R. Elliott, Prof. J. A. Nixon, Prof. Adam Patrick, Dr. W. N. West Watson. Hon. Secretaries: Dr. James Lindsay, 1, The Circus, Bath; Dr. F. G. Chandler, 1, Park-square West, Portland-place, London, N.W. 1.

Provisional Programme.—July 22nd.—Discussion: Rheumatoid Arthritis, its Causation and Treatment. To be opened by Sir Humphry Rolleston, followed by Dr. Rupert Waterhouse (Treatment), Sir Robert Jones (Surgical), Dr. J. M. H. Munro (Bacteriology), Mr. A. G. Timbrell Fisher (Pathological), Mr. W. R. Ackland (Dental), and Sir William H. Willcox.

July 23rd.—Discussion: Hyperpiesis. To be opened by Lord Dawson; followed by Prof. E. H. Starling, Dr. H. Batty Shaw, Dr. Otto May, and Dr. Geoffrey Evans.

July 24th.—Discussion: The Uses and Abuses of Endocrine Therapy. To be opened by Dr. W. Langdon Brown and Prof. Swale Vincent; followed by Dr. H. Gardiner-Hill, Mr. Kenneth M. Walker, Dr. H. W. C. Vines, and Prof. F. S. Langmead.

Surgery.

President: Sir Berkeley Moynihan. Vice-Presidents: Mr. A. H. Burgess, Mr. Frederick Lace, Mr. H. S. Souttar, Mr. C. F. Walters. Hon. Secretaries: Mr. A. de V. Blathwayt, 6, Brock-street, Bath; Mr. A. L. Fuller, 9, Gay-street, Bath; Mr. R. M. Vick, 152, Harley-street, London, W. 1.

Provisional Programme.—July 22nd.—Discussion: Carcinoma of the Stomach. To be opened by Sir W. I. de Courcy Wheeler; followed by Dr. E. I. Spriggs (Clinical Manifestations and Early Diagnosis), Dr. A. F. Hurst (Auxiliary Methods of Diagnosis, Radiological and Chemical), Prof. M. J. Stewart (Pathology: General Relation of Carcinoma to Ulcer; Mode of Spread and Frequency of Secondary Deposits in Liver), Mr. J. Sherren, Mr. John Morley, Dr. J. A. Nixon, and Mr. A. H. Burgess.

July 23rd.—Discussion: Acute Intestinal Obstruction. To be opened by Sir William Taylor; followed by Mr. W. Sampson Handley and Mr. D. P. D. Wilkie. A general report and statistics from various hospitals for the past five years will be presented by Mr. H. S. Souttar (London Hosp.), Mr. R. P. Rowlands (Guy's), Mr. C. Max Page (St. Thomas's), Mr. R. M. Vick (St. Bartholomew's), Mr. L. R. Braithwaite (Leeds), Mr. G. Grey Turner (Newcastle),

Mr. A. H. Burgess (Manchester), Mr. A. Rendle Short (Bristol), and Mr. A. B. Mitchell (Belfast).

July 24th.—Combined discussion with Orthopaedic Section: Treatment of Fractures, with special reference to its Organisation and Teaching. To be opened on the Surgical side by Mr. G. E. Gask; followed by Mr. S. W. Daw, Mr. H. Wade, Mr. H. H. Sampson, and Mr. A. W. Sheen; and on the Orthopaedic side by Sir Robert Jones; followed by Dr. R. Osgood (Boston, U.S.A.), Mr. H. Platt, Mr. H. A. T. Fairbank, Mr. C. Max Page, and Mr. Gwynne E. O. Williams.

Obstetrics and Gynaecology.

President: Lady Barrett. Vice-Presidents: Mr. H. S. Davidson, Mr. Eardley L. Holland, Mr. W. F. Rawson, Mr. D. C. Rayner. Hon. Secretaries: Mr. W. H. Duncan, 13, Gay-street, Bath; Dr. J. Bright Banister, 19, Harley-street, London, W. 1.

Provisional Programme.—July 22nd.—Discussions: (a) The Problems of Uterine Cancer. To be opened by Prof. B. P. Watson. (b) The Surgical Treatment of Malignant Disease of the Pelvic Organs. To be opened by Mr. Victor Bonney and Mr. S. J. Cameron. The following will take part in the discussions: Prof. C. Oldfield, Mr. H. J. D. Smythe, Dr. R. S. S. Statham, and Prof. W. C. Swayne.

July 23rd.—Discussion: The Treatment of Inoperable Cancer of the Pelvic Organs. To be opened by Dr. James Heyman (Stockholm); followed by Mr. Percival P. Cole and Mr. Malcolm Donaldson. Paper: Dr. D. C. Hare: Preliminary Investigation into the Circulatory Changes in Normal Pregnancies.

July 24th.—Discussion: The Role of Surgery in the Treatment of Backward Displacement of the Uterus. To be opened by Miss M. H. Frances Ivens; followed by Dr. H. Russell Andrews, Prof. J. M. Munro Kerr, Mr. R. H. Paramore, Mr. D. C. Rayner, Mr. D. Shannon, and Sir Henry J. F. Simson.

Pathology and Bacteriology.

President: Prof. J. C. G. Ledingham. Vice-Presidents: Dr. J. A. Braxton Hicks, Prof. E. H. Kettle, Dr. Rupert Waterhouse. Hon. Secretaries: Lieut.-Colonel James Cowan, 44, Combe-park, Bath; Dr. C. C. Okell, Wellcome Physiological Research Laboratories, Langley Court, Beckenham, Kent.

Provisional Programme.—July 22nd.—Discussion: Filtering Viruses. To be opened by Dr. W. E. Gye; followed by Mr. J. E. Barnard, Dr. Mervyn H. Gordon, Dr. S. P. Bedson, and Dr. J. E. McCartney.

July 23rd.—Discussion: The Pathological Basis of Treatment by Radiation. To be opened by Prof. S. Russ; followed by Dr. T. S. P. Strangeways, Miss M. E. Hume, and Dr. A. Piney.

July 24th.—Discussion: The Present Position of Pathology and Bacteriology in this Country, with special reference to Research. To be opened by the President of the section.

Neurology and Psychological Medicine.

President: Sir Maurice Craig. Vice-Presidents: Prof. Edwin Bramwell, Dr. Arthur F. Hurst, Dr. Norman Lavers, Dr. S. A. K. Wilson. Hon. Secretaries: Dr. Ray Edridge, 29, Gay-street, Bath; Dr. Edward Mapother, Maudsley Hospital, Denmark Hill, London, S.E. 5.

Provisional Programme.—July 22nd.—Discussion: Causation and Symptomatology of Multiple Neuritis. To be opened by Dr. T. Grainger Stewart; followed by Dr. James S. Collier, Dr. Wilfred J. Harris, Dr. W. Johnson, and Dr. F. J. Nattrass.

July 23rd.—Discussion: Treatment of Insomnia. To be opened by Dr. Robert Hutchison; followed by Dr. Harry Campbell, Dr. Henry Devine, and Dr. C. P. Symonds.

July 24th.—Discussion: Prophylaxis of Mental Disorder. To be opened by Sir Humphry Rolleston; followed by Dr. A. Helen A. Boyle, Dr. Bernard Hart, Dr. Edward Mapother, and Dr. T. A. Ross.

Therapeutics (including Balneology and Radiotherapy).

President: Prof. R. B. Wild. Vice-Presidents: Dr. Preston King, Dr. W. Mitchell, Dr. Nathan Mutch. Hon. Secretaries: Dr. Cecil H. Terry, 15, The Circus, Bath; Dr. Dorothy C. Hare, 1, Bickenhall Mansions, London, W. 1.

Provisional Programme.—July 22nd.—Discussion: Treatment of Asthma. To be opened by Dr. W. Langdon Brown, followed by Dr. E. P. Poulton, and Dr. P. Hamill.

July 23rd.—Discussion: Treatment of Chronic Arthritis. To be opened by Sir Thomas Horder; followed by Dr. Preston King (Balneology), Dr. N. Mutch, and Dr. C. B. Heald.

July 24th.—Discussion: Therapeutic Value of Light. To be opened by Prof. W. E. Dixon; followed by Dr. C. E. M. Jones (Clinical) and Dr. G. H. Lancashire. Paper: Dr. Newman Neild: The Uses of Posture for Bronchial Drainage,

Laryngology, Otology, and Rhinology.

President: Mr. Arthur H. Cheate. Vice-Presidents: Mr. Neil Maclay, Dr. Irwin Moore, Mr. Sydney R. Scott. Hon. Secretaries: Mr. H. N. Barnett, 27, The Circus, Bath; Dr. R. Scott Stevenson, 30, New Cavendish-street, London, W. 1.

Programme.—July 22nd.—Discussion: Overlooked Cases of Foreign Body in the Air and Food Passages. To be opened by Prof. Chevalier Jackson (Philadelphia); followed by Dr. Thomas McCrae (Philadelphia), Sir StClair Thomson, and others. Prof. Chevalier Jackson: (a) Demonstration on the Extraction of Foreign Bodies from the Air and Food Passages; (b) Cinematographic demonstration of Bronchoscopic Aspiration for Suppurative Diseases of the Lung of other than Foreign Body Origin. Dr. T. McCrae: Bronchoscopy for Disease. Mr. V. E. Negus: Evolutionary Factors in Causation of Pharyngeal Diverticula. Dr. Irwin Moore: An Outline of the History of Endoscopy.

July 23rd.—Discussions: (1) Operative Treatment of Chronic Middle-ear Suppuration. To be opened by Mr. G. J. Jenkins; followed by Mr. Sydney R. Scott, Mr. J. S. Fraser, and Mr. J. Bowring Horgan. (2) Treatment of Chronic Non-suppurative Middle-ear Deafness (excluding Oto-sclerosis). To be opened by Sir William Milligan; followed by Dr. J. Kerr Love, Sir Robert Woods, Mr. Neil Maclay, and Mr. H. Norman Barnett.

July 24th.—Discussion: Occupational Diseases of Ear, Nose, and Throat, and their Prevention. To be opened by Mr. F. H. Westmacott; followed by Surgeon-Commander S. W. Grimwade, Wing-Commander D. Ranken, Mr. T. Jefferson Faulder, Mr. C. A. Scott Ridout, and Mr. T. Ritchie Rodger.

The following Sections will each meet on two days:—

Diseases of Children.

President: Dr. Robert Hutchison. Vice-Presidents: Dr. Carey F. Coombs, Mr. P. T. Crymble, Dr. Charles McNeil, Dr. Reginald H. Miller. Hon. Secretaries: Dr. Vincent Coates, M.C., 10, The Circus, Bath; Mr. R. A. Ramsay, 123, Gloucester-terrace, Hyde Park, London, W. 2.

Provisional Programme.—July 22nd.—Joint discussion with the Section of Public Medicine: Rheumatic Infection in Childhood—Early Diagnosis and Preventive Treatment. To be opened by Dr. F. J. Poynton and Dr. R. A. Askins (M.O.H. Bristol); followed by Dr. Carey F. Coombs, Dr. Reginald Miller, Dr. J. A. Glover (Ministry of Health), and Dr. Vincent Coates.

July 23rd.—Discussion: Treatment of Empyema. To be opened by Dr. H. C. Cameron and Mr. H. S. Souttar; followed by Dr. F. G. Chandler, Mr. H. W. C. Romanis, and Mr. T. Twistington Higgins.

Ophthalmology.

President: Dr. W. Mardon Beaumont. Vice-Presidents: Dr. R. Wallace Henry, Mr. A. W. Ormond, Mr. C. H. Walker. Hon. Secretaries: Dr. R. Colley, 30, The Circus, Bath; Mr. P. G. Doynce, 8, Harley-street, London, W. 1.

Provisional Programme.—July 22nd.—Discussion: Eye Injuries and Interstitial Keratitis. To be opened by Mr. W. T. Holmes Spicer.

Papers: Mr. A. W. Ormond, Visual Hallucinations of Sane People. Mr. N. Bishop Harman: Phlyctenular Conjunctivitis and Keratitis—Causes and Prevention. Dr. R. Wallace Henry: Instrument for Recording Light Minimum and Light Difference. Dr. R. Colley: Case of Perforating Wound of Eye with Retention of Piece of Glass.

July 23rd.—Discussion: Ocular Pain. To be opened by Mr. A. Freeland Fergus.

Papers: Mr. C. H. Walker: Amaurosis. Mr. Lindsay Rea: Treatment of Ocular Syphilis. Mr. J. Burdon-Cooper: Conservative Treatment of Glaucoma.

Orthopaedics.

President: Prof. E. W. Hey Groves. Vice-Presidents: Dr. Naughton Dunn, Mr. G. R. Girdlestone, Mr. E. Muirhead Little. Hon. Secretaries: Dr. J. S. Levis, M.C., 20, Gay-street, Bath; Mr. T. Twistington Higgins, 27, Harley-street, London, W. 1.

Provisional Programme.—July 23rd.—Discussion: Tuberculous Disease of the Spine. To be opened by Prof. Calvé (Paris); followed by Mr. G. R. Girdlestone, Mr. W. T. G. Pugh, and Mr. James Russell.

July 24th.—Joint discussion with Section of Surgery on the Treatment of Fractures, with special reference to Organisation and Teaching. (See above.)

Public Medicine.

President: Dr. T. Eustace Hill. Vice-Presidents: Dr. T. W. Naylor Barlow, Dr. J. F. Blackett, Dr. W. A. Brend, Dr. S. Noy Scott. Hon. Secretaries: Dr. R. E. Thomas

11, Darlington-place, Bath; Dr. A. Neville Cox, 21, Cornwall-gardens, Preston Park, Brighton.

Provisional Programme.—July 22nd.—Joint discussion with the Section of Diseases of Children: Rheumatic Infection in Childhood—Early Diagnosis and Preventive Treatment. To be opened by Dr. F. J. Poynton (Children's Section) and Dr. R. A. Askins, School Medical Officer and M.O.H. Bristol (Public Medicine Section).

July 23rd.—Discussions: (1) Food Manipulation in Relation to Health. To be opened by Dr. W. G. Savage. Dr. C. E. Goddard will speak with special reference to Accidental Contamination. (2) Influence of Sunlight and Artificial Lights on Health, including Smoke Pollution. To be opened by Dr. Leonard Hill; followed by Dr. G. B. Dixon, who will speak particularly on the Influence of Light on Tuberculosis, and Dr. Dora C. Colebrook.

The following Section will meet on one day:—

Medical Sociology.

President: Dr. Charles E. S. Flemming. Vice-Presidents: Dr. J. W. Bone, Mr. Wilfred Buckley, Mr. G. P. Male, Dr. E. A. Starling. Hon. Secretaries: Dr. C. A. Marsh, The Roseries, Englishcombe, Bath; Dr. C. J. Buchan, 326, Brownhill-road, Catford, London, S.E. 6.

Provisional Programme.—July 24th.—Morning.—Discussion: What should be the Standard of Purity of Milk? To be opened by Dr. R. Stenhouse Williams, from the point of view of the bacteriologist; Dr. W. G. Savage, from the point of view of the medical officer of health; and Dr. Eric Pritchard, from the point of view of the dietist. Afternoon.—Discussion: By What Means can Pure Milk be Obtained, and the Cost? To be opened by Mr. Wilfred Buckley (National Clean Milk Society), as a producer; Mr. G. P. Male, as a veterinary surgeon; and Mr. J. H. Maggs (chairman, United Dairies), as a distributor. Two films will be shown with the following titles: Production of Certified Milk on an English Farm, and Handling and Distribution of Milk in New York City.

THE BRITISH SOCIAL HYGIENE COUNCIL (LATE NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES).

THE British Social Hygiene Council held their tenth annual meeting on July 9th in the Robert Barnes Hall of the Royal Society of Medicine. Sir Auckland Geddes delivered the presidential address.

Annual Meeting.

The President, in his opening remarks, paid a tribute to his predecessor, Lord Trevethin, who had done so much to combat venereal disease. He went on to point out the unusual interest of the occasion; the Council was now looking back over 11 years of activity and difficulty during which great progress had been made. Between the years 1920 and 1924 the numbers of new cases of syphilis at the treatment centres had fallen from 43,000 to 22,000, while the number of attendances had risen from under 1,500,000 to 1,645,000. It was clear from these figures and others that venereal disease had been combated in this country with increasing success, though the end was not yet in sight. The British Social Hygiene Council, coöperating with the Ministry of Health and the local authorities, had done a great deal towards this result. In order to determine the aims of the Council for the future it was necessary to consider what the reduction of venereal disease would mean not only for the present generation but for posterity. The figures quoted showed that the number of new infections had definitely diminished, so that every unborn child had a proportionately greater chance of escaping infection. The Council looked forward over a vast field of effort, and while they saw clearly that medical work against venereal disease was profoundly important and was progressing rapidly, yet the problem had many other aspects. There was no group of diseases in which medical, social, and moral problems were so inextricably interwoven, and medicine could not achieve victory over venereal disease by itself. The change in their

title showed that the Council had greatly enlarged their scope and they now aimed to preserve and strengthen the family. It was very necessary in these days to impress upon the conscience of the people that the family was the basic social unit. No one who took thought for the future of the country could fail to realise that the foundation of its greatness was the health of its stock, and so the British Social Hygiene Council appealed to all the citizens of the Empire and of other countries to secure that future generations should be uncontaminated by a preventable and curable disease.

The Council aimed at promoting a high standard of sex conduct. Sexual morality was closely connected with housing, and the horrible conditions under which human beings were herded together went far to explain the present low standard of morality. The Council joined hands with all who worked to improve the conditions of life, housing, recreation, and the whole environment of those who were compelled from poverty to live under conditions sometimes too dreadful to describe. The medical attack must be strong, thorough, and frank, but they would have to make every effort to improve the lives of the people.

The Viscount Illingdon, a Vice-President of the Council, and Chairman of the Indian Council, pleaded for an extension of their work in the British Empire and particularly in India, which contained three-quarters of the Empire's population and where the high incidence of venereal disease was very serious. He thanked the Indian Medical Services for the work they had done in fighting venereal disease in India and hoped that the Government departments would assist in every possible way to eliminate it, though he realised that they had to contend with great difficulties.

Mrs. Garlin Spencer, a Director of the Board of the American Social Hygiene Association, described the evolution of similar social work in America.

Official Banquet.

In the evening a dinner was held at the Hotel Cecil to celebrate the successful results of 11 years' work and to initiate the broader policy. After the loyal toasts had been honoured the health of the British Social Hygiene Council was proposed by Lord Merrivale, President of the Divorce Court, who spoke of the "conspiracy of silence" which had surrounded the "social evil" in his youth and of the courage with which the present generation was breaking that silence and attacking that evil. He saw in this new attitude, reflected in the new name of the Council, a possibility of success that had not existed in the old days.

Sir Auckland Geddes, responding to the toast, recalled the national stocktaking in the days of the war and the realisation of the heavy toll venereal disease was then taking of the country's health, strength, and vitality.

The health of the guests was proposed by Mr. Greaves Lord, K.C., M.P., in the absence of Mr. J. Wheatley, M.P. He said that the greatness of England depended on the performance by each generation in turn of its duty to posterity, and no greater work for the future could be found than that of the Council of Social Hygiene.

Surgeon Vice-Admiral J. Chambers, Medical Director-General of the Navy, in responding, gave a brief account of the very successful results of instruction in the home water fleet and the great fall in the incidence of venereal disease in the mercantile marine. The reports from foreign waters, especially the Far East, were less satisfactory.

The toast of the "Associated Organisations" was proposed by Mrs. Scharlieb, M.D., who described the correlation of the work in England, America, Canada, Australia, and South Africa. Mrs. Scandrett (South Africa), Mrs. Anna Garlin Spencer (America), and Dr. Kendal Bates (Canada) replied, and the proceedings concluded with the health of the President, proposed by Mr. E. B. Turner.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

THE sixth annual general meeting of the Society for the Prevention of Venereal Disease was held at 12, Stratford-place on July 8th. The President of the Society, Sir Auckland Geddes, occupied the chair, and said there had been a very great reduction in venereal disease, amounting to nearly 50 per cent., within the last five years. He did not think any one organisation could claim that this reduction was the result of their labours alone, for all who had taken part in attempting to educate the people as to the importance and dangers of venereal disease and in teaching the public how to prevent the disease might say they had contributed to this great improvement. He said that he believed that fusion between the British Social Hygiene Council and the Society for the Prevention of Venereal Disease was undesirable because, although both the societies had accepted the Trevethin report, they had accepted it with quite different emphasis laid upon the different recommendations. He thought that when dealing with such a subject as venereal disease it was inevitable that those at the one extreme of thought would find it impossible to understand the point of view of those at the other extreme of thought, although both extremes and those between them were working for the same end. He considered that the Society for the Prevention of Venereal Disease had got hold of a very important part of the work which has to be done. What they desired to see was that the causal organisms of the different diseases should be destroyed whenever and wherever they might be found, and that this matter should be dealt with unsentimentally, and though there was a wide field for coöperation with those who laid the emphasis on the moral and emotional side, an attempt to get all who are working for the prevention of venereal disease into one society would result in a great loss. In the belief that the continuance of the two organisations is good and that it is really better than fusion, he had, after careful consideration, accepted the position of President not only of this Society but of the other society, believing that in that way, although the societies continued as separate and independent bodies, it would be possible to present a united front to the Government or the Department of State concerned. He thought that it would be wise for the Society to concentrate upon getting a definite reply from the Ministry of Health in the coming months, and he proposed that the resolution before the meeting should be laid before the Government in the autumn in the following terms:—

"That this meeting with great respect urges the Government to give effect without further delay to the recommendations contained in the Trevethin Report, which the Minister of Health has stated have been accepted in principle, and further begs to call the attention of the Minister of Health to the resolution submitted to the Ministry of Health at the annual general meeting of the Society in July, 1924, requesting the allocation to the Society for the Prevention of Venereal Disease of an equitable proportion of any sum set aside for the education of the public regarding venereal disease and its prevention, to which no reply has yet been received."

Mr. Wansley Bayly, honorary secretary of the Society, reported the work of the Society during the past year, and said that a new situation had arisen owing to Sir Auckland Geddes having accepted also the presidency of the British Social Hygiene Council, but their Society would do their best to help him in this new situation. Important progress had been gained during the last year by Sir Auckland Geddes's double appointment and by the acceptance of the principle of immediate self-disinfection by the British Social Hygiene Council. He added that the Ministry of Health had acknowledged that the evidence of witnesses before the Trevethin Committee was available for reference or publication.

Mr. Harry Machin presented the financial report and annual audit.

Lady Askwith, in seconding the resolution, said she thought many of the members of the Society would agree that Sir Auckland Geddes was right in maintaining that fusion between the two societies was not possible or desirable, and she was also sure that there would be nobody who did not feel perfectly safe in the hands of Sir Auckland Geddes as President of both organisations.

Mr. Basil Peto, M.P., in supporting the resolution, expressed his pleasure in hearing that the President had also taken the position of President of the other society, and he entirely agreed with the conclusion reached that fusion would not have been a source of strength, but the best possible liaison between the two societies was to have one head for both. It was, he reminded the audience, two years since the committee presided over by Lord Trevethin reported, but no steps had been taken to carry out what their Society regarded as the most important part of the report, that dealing with the sale of the necessarily simple preventive disinfectants at chemists' shops.

Mr. A. J. Bennett, M.P., said that the Society could not expect to obtain all their revenue from a very limited number of persons, and that it was only right they should try to get funds from the public.

The resolution was put to the meeting and carried unanimously.

CONVENTION OF ENGLISH-SPEAKING OPHTHALMOLOGICAL SOCIETIES, LONDON, JULY 14TH-17TH.

OPENING SESSION.

THE formal opening of the Convention took place in the Memorial Hall, University College, on Tuesday morning, when speeches were delivered by Mr. Neville Chamberlain, Minister of Health, and Mr. Houghton, the American Ambassador.

Addresses of Welcome.

The Minister of Health first referred to the hiatus produced in the holding of large, and especially international, congresses by the Great War, and said that though the members of this Congress would regret the absence of the wider scope and the more varied treatment which would be derived from the attendance of delegates from all over the world, there was some compensation in the fact that the language which would be used would be understood by all. He alluded with satisfaction to the striking advances which had been made in ophthalmology in the last 70 years, particularising the discoveries relating to the powers of accommodation and the accuracy of the instruments now available. He also referred to the great attention being given to the eyesight of children, and the energy with which ophthalmic clinics, 482 in number, were being conducted. Such attention was increasingly necessary with the ever augmented stress and hustle of the life of cities. He warmly commended the spirit which had resulted in the organisation of this Congress, and which would bring about improved knowledge in regard to the preservation of the function of the most precious of all the special senses.

The American Ambassador (Mr. Houghton) expressed, on behalf of the American visitors, appreciation of the welcome which had been accorded them by the Minister of Health, and humorously warned his compatriots to beware of the elaborate hospitality prepared for them by the organisers of the Convention. He also affected an anxiety about the welfare of the population of the States with so many of the country's eye surgeons in a foreign land.

The following representatives of visiting bodies were then presented to Mr. Chamberlain, and delivered short speeches expressing the satisfaction which it gave them to be present: Dr. G. E. de Schweinitz (American Ophthalmological Society), Dr. W. R. Parker (Ophthalmological Section of the American Medical Association), Dr. L. M. Francis (American

Academy of Ophthalmology and Oto-Laryngology), Dr. W. G. M. Byers (Montreal Ophthalmological Society), and Dr. A. J. Hall (New Zealand Branch of the British Medical Association).

Presentations.

The President, in presenting the Nettleship Prize to Prof. S. E. Whitnall, of Montreal, for his monumental work on the anatomy of the orbit, said Edward Nettleship and Sir William Bowman both left deep footprints in the sands of time. In memory of the latter had been established the Bowman Lecture, and to commemorate the name of Nettleship his friends had established a prize for the encouragement of ophthalmic work, to be awarded triennially. It was, the President said, a great pleasure to him that Prof. Whitnall had been able to come from Montreal to receive the award at his hands.

Prof. Whitnall, in a few words of thanks, said it was a real pleasure to him to be able to renew friendships which were formed in the early days of the Oxford ophthalmological congresses, where the friendly talks on ophthalmological subjects were the mainsprings of any subsequent work he felt called upon to do in relation to the eye.

Mr. W. T. Holmes Spicer then presented to the President the Critchett Memorial Presidential Badge. It was, he said, Sir Anderson Critchett's father, George Critchett, who lived through the great time of ophthalmological discovery and research, that blossoming time when the ophthalmoscope was discovered, and father and son had together practised the specialty for nearly 100 years, probably a record of its kind. George Critchett was not a prolific writer; his chief energies were clinical, and the devising of operations for various ocular conditions. Sir Anderson Critchett was born in an atmosphere in which he might be said to have lisped ophthalmology. But he had the disadvantage in early years of a divided allegiance, for he was devoted to music and was the possessor of a fine voice, hence his singing was in great request. There came a time when his father told him he must make his choice; he must either be a singer or a surgeon, and the world knew what the choice was. To his credit it must be said that though formerly he was continually singing at concerts, when he decided on his life's career he never sang again in public. Mr. Spicer paid a high tribute to Sir Anderson Critchett's fine qualities, social and professional, and then invested the President with the badge, beautifully worked in gold, and bearing portraits of George and Anderson Critchett, with a Latin inscription. He wished the President a long life and a continuation of the fine work which he had been doing during the last forty years.

THE PRESIDENT'S ADDRESS.

The Elimination of Eye Disease.

Mr. Treacher Collins then delivered his presidential address. His purpose, he said, was simply to present a few historic facts which, aided by imagination, would enable a peep to be taken through a hole in the curtain of the present and gaze at some wonders that might come to pass. For the elimination of disease it was essential to know everything concerning the working mechanism of the organism and the varying conditions of its environment; and owing to recent work it had now become possible to contemplate the elimination of some eye diseases in the human organism. In *leprosy* the eyes were frequently affected and the sight destroyed. Probably many cases of the disease were brought there by the returning Knights Templar and their retinue, among whom lack of cleanliness was regarded as a virtue. To the segregation of the affected was probably due the absence of more serious spread. But there were still 300,000 cases of leprosy in the British Empire.

With regard to *small-pox* three-fourths to one-half of the indigent blind applying for relief in the last century in this country lost their sight through this disease, but in 1922 the Departmental Committee on the causes and prevention of blindness could only discover six cases due to it in asylums for the blind.

Much of this improvement was due to the greater care now paid to the eyes in critical pyrexial diseases, as well as to the reduction in the number of cases of small-pox.

Speaking of *ophthalmia*, Mr. Collins mentioned the work done on the modes of transference of the disease. The causal organisms did not produce spores, and drying killed them, hence infection was only likely to occur while the eyes were in a moist state. No specific microbe had been identified with the worst form of *ophthalmia*—namely, trachoma—but it was probable that this virus also was killed by drying; and general measures based on this had largely eliminated this disease from the British Army and from the Poor-law schools of London, where at one time it was rife. A tribute to the cleanliness of the modern British soldier was that the Egyptian Expeditionary Force fought its way along the same route as did the trachoma-infested Napoleonic troops without contracting it, but when large numbers of Turks were taken prisoner they were found to be severe sufferers from trachoma with corneal complications. At an inspection made by Nettleship of the Poor-law schools of London in 1874, 42 per cent. were found to have granular lids or trachoma, but in 1896 Sydney Stephenson found the figure reduced to 4.91 per cent. The disease was virulently contagious, and liable to rapid spread in favouring conditions.

The protean manifestations of *syphilis* were one of the commonest causes of eye disease in this country; the departmental committee already referred to considered that from 10 per cent. to 15 per cent. of the blindness of the country was due to this disease. Mr. Collins did not share a hopeless view as to the elimination of syphilis among the community; in this contest between man and the spirochæte the odds were undoubtedly on man. An encouraging stage was reached when the appointment of the Royal Commission on the subject broke down the conspiracy of silence which until then had surrounded it. In 1920 105,185 infected people presented themselves at the official treatment centres, and in 1923 the number had declined to 73,613; and a similar fall had occurred in other countries where similar facilities were provided. He thought that in respect of the wilful transfer of these diseases to others the punishment should be made to fit the crime—namely, incarceration and treatment until the convicted person could be declared free from the infection.

Concerning *iritis* in the last 25 years a great change of view as to the ætiology had taken place. What had been described as "rheumatic iritis" was very rarely associated with acute articular rheumatism; the commonest form of joint affection found in association with iritis was gonorrhœal, a disease which was present in 15 per cent. of the cases.

The recognition of *metastatic septic infection* as a cause of iritis was largely due to the work of Mr. William Lang, who found that in 37 per cent. of his cases of iritis pyorrhœa was the sole ascertainable cause; certainly rapid recovery of the iritis followed removal of the affected foci, no other treatment but heat and atropine having been used. If more mouths were kept clean and if it was realised that a gold-crowned tooth could harbour bad septic foci, the total amount of intra-ocular inflammation would be materially reduced.

It was not possible to say as a result of statistics whether *tuberculous* eye disease was diminishing, but both here and in America there had been noted a steady reduction in the amount of respiratory tuberculosis, and the death-rate from it showed a bigger drop than in any other period of which there were authentic records. He alluded to the great improvement in the condition of cases of tuberculous eye disease when they were removed from their homes to Swanley Ophthalmia Schools, and this he attributed to the sunshine and out-of-door life, and the good food and ample playing spaces.

The elimination of *phlyctenular* ophthalmia and keratitis was a social problem, being bound up with over-population and living in congested conditions.

He referred to the importance of the diet including fat-soluble A vitamin, especially in the obviation of xerophthalmia and keratomalacia, the latter, however, being but a rare disease in this country.

Certain *hereditary diseases of the eye* seemed to be chiefly due to a tissue degeneration; such was retinitis pigmentosa, a condition which was very resistant to every known treatment. And it was regrettable that the parents suffering from this disease were the reverse of sterile. It would be a proper course to advise sufferers who had married to refrain from bearing progeny.

Myopia Mr. Collins considered to be largely the outcome of our present system of education. It seemed altogether unnatural that the young growing (human) animal should be compelled to spend hours daily poring over books, often in artificial light, and educational authorities were remarkably slow in taking advantage of other educative means, such as the epidiascope, oral teaching to a greater extent, broadcasting, and the use of the lantern. Lessons in geography, for instance, could be converted into a veritable voyage of discovery for the young mind.

In conclusion the President referred to the work which had been done in the seven years of its existence by the Council of British Ophthalmologists, which was formed to assist Government Departments and other persons in regard to its special subject. The United States now had a parallel body with very similar aims. He also referred to the work of the new International League of Red Cross Societies, and to that done by the Health Department of the League of Nations, the latter having conducted investigations likely to have far-reaching results. Disease, he said, was the common foe of all nations, and active coöperation on the part of all of them was required in order to build up a more moral, more intellectual specimen of *Homo sapiens* than that now striding the earth, pluming himself on being the lord of creation.

BRITISH EMPIRE CANCER CAMPAIGN. ANNUAL MEETING.

THE second annual report of the Grand Council of the British Empire Cancer Campaign was presented by the chairman, Viscount Cave, at a meeting held at the House of Lords on Monday, July 13th, when a message was read from the Duke of York, President of the Campaign, wishing success to its labours. The campaign, which came into existence in the spring of 1923, has had at its disposal a sum of just over £100,000, which has enabled the Council to assist existing cancer research institutions to maintain their work at maximum efficiency as well as to initiate and devise fresh lines of research. A concerted effort is being made to obtain trustworthy statistics of cancer from outlying parts of the Empire. Help is being freely given to expensive and difficult research in connexion with the causation and treatment of cancer by means of radium, X and other rays, carried on jointly with the Radiology Committee of the Medical Research Council. Radium to the value of £5000 has been purchased and put at the disposal of this joint committee, while the Radon Centre at the Middlesex Hospital has undertaken the production and supply of radium emanation. Lord Cave concluded his review of the year's activities with the warning that only by continuous and patient effort can knowledge be increased and results achieved. At the Council meeting which followed Dr. J. A. Murray, of the Imperial Cancer Research Fund, and Lieut.-Colonel A. B. Smallman, secretary to the Departmental Committee on Cancer, were invited to join the Intelligence Committee of the Campaign.

The report contains a summary of the work of the various committees of the Campaign. During the year the Financial Committee announces an income from donations and collections of £31,168, plus £2606 bank interest, out of which £2380 have been used up in administration and £3361 in appeals, a percentage—

be it noted—of only 9.2 of the total funds raised during the period. £280 have gone to travelling and incidental expenses of committees and lecturers, while grants for research work have totalled £16,170. Grants are made on the recommendation of a Scientific Advisory Committee appointed jointly by the Royal Society, the Medical Research Council, and the Cancer Campaign. Institutions have benefited as follows: £3725 to the Medical Research Council (Radon Centre at Middlesex Hospital), £6900 to the Middlesex Hospital (Cancer Research Department), £5000 to the Cancer Hospital Research Institute, £1695 to St. Bartholomew's Hospital (Radiological Cancer Research Department), £1000 to Christie Hospital, Manchester, £600 to St. Mark's Hospital, London, £200 to Coombe Lying-in Hospital, Dublin, £1500 to the Tropical Disease Prevention Association, and £5000 to the purchase of 800 mg. of radium for cancer research divided between St. Bartholomew's Hospital, St. Peter's Hospital, and the Medical Women's Federation. Individual grants have been made to Dr. Thomas Lumsden (Lister Institute), Dr. Malcolm Donaldson, Dr. Louis Sambon, Dr. J. C. Mottram (Radium Institute), and Mr. I. Hieger, B.Sc. (Cancer Hospital Research Department).

A notable change has been effected in the organisation of cancer research at the Middlesex Hospital, where the scientific departments have been invited to initiate cancer research along their own special lines under the supervision of Prof. J. McIntosh (pathology), Prof. S. Russ (physics), and Prof. E. C. Dodds (biochemistry). At the Cancer Hospital a scheme of work has been initiated under the five headings of: (1) experimental production, (2) clinical and surgical pathology, (3) immunity experiments, (4) experiments in chemotherapy, (5) statistical inquiries. An interesting research has been in progress to test the effect of prolonged administration of food preservatives on animals; so far small amounts of boron, tin, and copper oft repeated have had no appreciable ill effect on mice and rats. At St. Bartholomew's Hospital a special X ray research department has been set apart for investigating malignant disease of the breast, the upper air passages and pharynx, and the uterus. At Manchester a local cancer committee will shortly take over the general management of research in the various institutions; a questionnaire has been issued in order to trace the history of all cancer patients in the city. At St. Mark's Hospital the outcome of some recent work suggests the important part played by lymphoid follicles of the intestine in the protection of the body against cancer. Dr. Lumsden's work at the Lister Institute on an antiserum, selective for particular cancer cells, is familiar to our readers and is being continued. The grant to the Tropical Disease Prevention Association for investigation of cancer in relation to parasites carries the proviso that cancer material, both animal and human, and specimens of parasites shall be brought back to this country for investigation.

The report, which contains much else of interest, bears striking testimony to the wide range of inquiry instituted by the British Empire Cancer Campaign, the address of which is 19, Berkeley-street, London, W. 1.

THE BATEMAN APPEAL.

As already explained in THE LANCET, it has been felt that material assistance ought to be offered to Dr. Bateman to meet the legal expenses of his successful appeal and to make good the deficiency in his professional income. Accordingly the Bateman Fund has been opened and lists of contributions have appeared in recent issues. We have received additional contributions as follows:—

	£	s.	d.
Already received and acknowledged	493	3	0
Drs. Gerrard, Bickford, and Cloake	3	3	0
Dr. E. W. Dewey	1	1	0
Dr. Mary Kidd	0	10	0
Dr. Mohammed Eid	0	10	0
	£498	7	0

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Heart Cinematography.

PHYSICIANS are finding that disorder of rhythm is an increasingly valuable guide in the diagnosis and treatment of heart trouble, and its value is proportioned to the accuracy with which it can be observed. Auscultation is useful, but some method of recording the movements is essential for precise observation. The thoracic cage hides a living heart from sight, and few practitioners have time to study artificial contractions in the laboratory. Mr. Lutembacher's method of filming the isolated and perfused heart therefore fills a pressing need. He has already used his device to show his students the more common rhythmic disorders and to help them to understand the electro-cardiographic curves taken at the same time as the moving photograph. The next step is to use this method to examine the direct action of cardiac remedies. Marey has already used it to observe the contraction of voluntary muscles.

Narcotic Poisoning.

Dr. Ch. Achard recently reported to the Academy of Medicine five cases of suicidal narcotic poisoning of which two were fatal. Four were due to dial and one, which recovered, to veronal. A clinical phenomenon worthy of note was the very marked muscular hypotonus observed in these cases, contrasting with the brisk reflexes, Babinski's sign even being obtained. In one case catatonic attitudes appeared; in another a syndrome recalling that of disseminated sclerosis, slurring speech, ataxia, fine intention tremor, and nystagmus; in a third case the pupils were fixed. The growing frequency of these cases of poisoning proves the necessity for regulating the sale of narcotic drugs.

The Efficacy of Vaccination and the Virulence of Small-pox.

Dr. Alcaï, of Nîmes, has just published some important statistics of the epidemic of small-pox in Switzerland in 1921. The form of the infection was mild and vaccination was completely protective. The German cantons, where vaccination is voluntary, were all swept by the disease, those where it is obligatory escaped altogether. Emergency vaccination measures were successful in stamping out the epidemic wherever they were applied. Such evidence of the value of compulsory vaccination ought to have persuaded the Federal Council to impose it on the whole country, but the Government, remembering the difficulties encountered in a similar attempt in 1882, and also considering the mildness of the infection, only ordered vaccination for certain groups of the population. These half measures cost Switzerland several thousands of sick people and a few deaths, but the results would have been very grave if the epidemic had had the usual severity of small-pox.

Dr. A. Netter has recently drawn the attention of the Academy of Medicine to the frequency of small-pox and the tendency of the disease to take a benign form. The condition seemed about to disappear from civilised countries, but during the last few years has shown an unexpected recrudescence, particularly in Switzerland and England. In the former country only 14 cases were registered between 1915 and 1920, but the numbers rose abruptly to 596 in 1921, 1159 in 1922, and 2145 in 1925. They fell again in 1924 to 1245, and in the first five months of 1925 to 156. In England and Wales 7 cases were recorded in 1917 and 63 in 1918. In 1919, 1920, and 1921 there were 311, 280, and 336 cases respectively; in 1922 there were 973, in 1923 2054, and in 1924 3395. Already 3008 notifications have been received for 1925. In both these countries anti-vaccination influence has been at work. In Switzerland it has succeeded in removing the regulation of vaccination from the hands of the Federal Government to the cantonal authorities.

Since 1888 there has been no compulsory vaccination in most of the German cantons, and these cantons showed (from 1921-23) a small-pox incidence of 1910 per 1000, while the incidence in the French cantons was 24. Although the number of cases has increased so greatly the number of deaths, always less than 1 per cent., has dropped sometimes to less than 1 per 1000. Small-pox has lost its virulence; even among the non-vaccinated it is milder than it used to be among the vaccinated.

The American Medical Week in Paris.

Nearly 500 physicians and surgeons from the United States and Canada, many of them accompanied by their wives, are now visiting the hospitals and laboratories of Paris. The week was inaugurated in the great amphitheatre of the Faculty of Medicine, under the presidency of Mr. Herriot, President of the Chamber of Deputies, supported by Dr. Charles Mayo, of Rochester, and Mr. Peck, of Chicago. Among those present on the platform were the Minister of Public Instruction and of Hygiene, the Director of Higher Education, the Rector of the University of Paris, the Dean of the Faculty, and Mr. Tuffier, President of the organisation committee. Many congratulatory speeches were made. On leaving the building the members of the congress proceeded to the Arc de Triomphe to pay homage at the tomb of the unknown warrior. In the afternoon there was a reception at the Hôtel de Ville, when Mr. Guillaumin, President of the Municipal Council, conveyed a welcome from the City of Paris.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Prof. Bier on Homœopathy.

Prof. Bier, the celebrated surgeon of Berlin, has caused a considerable sensation in medical circles by an article to the *Münchener Medizinische Wochenschrift*, in which he recommended the study of homœopathy. He said that the homœopathic doctrine had in some respects proved true; the treatment of inflammation by artificial congestion instead of the application of cold devised by himself and counter-irritation therapy were based on the theory of *similia similibus*. He had himself lately found that bronchitis caused by the administration of ether could be successfully treated by subcutaneous injections of ether; the application of hot air to a burn produced a rapid development of new epithelium. With regard to homœopathic dosage of certain substances, he had found from personal experience that one drop of iodine dissolved in a glass of water would abort the colds to which he himself was liable. In his hospital furunculi were treated with very small doses of sulphur, whereas it was known that large doses produced furunculi. Hahnemann's advice to ascertain the reaction of a healthy person to a certain remedy before deciding on the dosage in any disease he thought quite reasonable. Prof. Bier's manifesto was received enthusiastically by the medical and lay adherents of homœopathy. The homœopathic journals reproduced it with sensational headings such as "celebrated professor converted to homœopathy" or "Hahnemann's works recommended by University Professor," &c. Copies of the article were distributed in meetings of the homœopathic societies and the homœopaths renewed their old demand that chairs of homœopathy be instituted at the universities. The medical press, commenting on the whole affair, stated that by reopening a discussion which had apparently been closed many years ago Prof. Bier had done great damage, especially to the younger generation, whose therapeutical views were not quite settled. To combat that damage the *Münchener Medizinische Wochenschrift* published a reply to Prof. Bier by Prof. Henbuer, the well-known Professor of Pharmacology at Göttingen University; the *Deutsche Medizinische Wochenschrift* reprinted articles which had appeared in former issues by the late Prof. Harnack dealing

with that question. The Berlin Society for Internal Medicine convoked a medical meeting in the Langenbeck-Virchow House, Prof. Bier being in the chair. The great assembly hall was crowded as never before, more than 1200 medical men and women being present. Strict control was carried out at the entrance to prevent laymen from entering, the daily papers having drawn the attention of the public to the meeting. Before the meeting Prof. Müller, of Marburg, gave a report of the history of homœopathy, Prof. Heubner, of Göttingen, spoke on the differences between the dogma of homœopathy and experimental natural science. In the discussion Prof. Bier said that medicine was more than a natural science; it ought to be regarded as an art where intuition is essential. Medicine had often been advanced by the intuition of men of genius, even if their views had not been in accordance with natural science. According to him, Hahnemann was such a genius, although his works must be regarded as a mixture of the highest wisdom and the greatest folly. He had expected to be severely attacked by his professional brethren. He was far from being converted to homœopathy, as had been suggested both in the press and in letters received by him, but he only wished to draw attention to the fact that there was some truth in homœopathy. It was useless to treat its adherents with contempt, rather should harmony be brought about between homœopathy and allopathy. With the exception of some homœopaths, all the speakers combated Prof. Bier's views. The meeting lasted about four hours and ended late in the night.

Lawsuits between Medical Men and Locum Tenents.

The great medical union known as the Hartmann-Bund, formerly Leipziger Verband, provides its members with locum tenents in cases of absence or illness, a work done in England by private medical agencies. Candidates to such posts had to subscribe a declaration that they would abstain for a couple of years from settling in the town or district of their employer. This declaration led in many instances eventually to lawsuits where it was not observed by the locum tenens, who settled down in his former employer's neighbourhood and did him grave damage. Law courts had given different verdicts in the matter, some stating that such declarations were not in accordance with the law, whilst others had found for the plaintiffs. By a recent judgment of the High Court of Justice the matter is now definitely settled. It is decided that the declaration must be regarded as illegal; as the medical profession is a scientific institution controlled and protected by the State for the welfare of the population, members of that profession cannot be denied the exercise of their calling through private agreements on merely economical grounds. This judgment is obviously not in accordance with the present economical condition of the profession. Doctors must have recourse to such private agreements in order to protect their economical interests, although they were blamed in so doing by the High Court. Medical men do not see the meaning of "State protection" in a country where anybody is allowed to give medical advice and charge fees for it without being medically qualified provided he does not make use of a recognised medical title.

Doctors' Income-tax.

In a recent leading article in THE LANCET, entitled "Penalising Medical Efficiency,"¹ it is stated that according to a decision of the High Court a county medical officer is not entitled to deduct the amount of his subscriptions to medical societies from his income-tax assessment. It may be of interest to English readers to learn what the law and the regulations are in Germany concerning the items to be deducted by a medical man. The German High Court has lately decided that every expense which served to keep a medical man abreast with new scientific research and to increase his knowledge in order to apply new

¹ THE LANCET, June 6th, p. 1191.

methods of treatment may be deducted. Those expenses include subscriptions to medical journals, membership of medical societies, travels to medical congresses, and post-graduate courses. A certain amount may be deducted annually for the amortisation of the cost of a medical library. According to a later decision the subscriptions, but curiously not the entrance fees, to professional societies having no scientific but only economical aims are deductible. Like other professional men a medical man is entitled to deduct from his net income that part of his house rent which covers the rooms used solely for the conduct of his practice—viz., the consulting and the waiting-room and the expenses for heating and lighting them, the depreciation of furniture, of instruments, and the telephone. If a servant is employed exclusively for the conduct of practice, the total salary may be deducted; if the servant does other housework also, a part of it only. The expenses entailed in keeping a carriage, a motor, or a bicycle together with the salary of the driver or chauffeur are also exempt, and it does not matter if the medical man uses those vehicles occasionally for non-professional purposes, it being supposed that he would not have bought them except as a help in his practice. During the time of the depreciation of the currency, when it was impossible to fix those expenses, medical men had to deduct 25 per cent. of their net income for "professional expenses."

Syphilis of the Stomach.

At a recent meeting of the Berlin Surgical Society Dr. Rumpel reported cases of gummata in the stomach lately operated on by him. He stated that such cases were very rare. Several forms of syphilitic affections of the stomach must be distinguished: (a) Gastritis with thickening of the wall of the stomach, caused by a proliferation of the submucosa; (b) gummata, multiple or single, which might become ulcerous and, like other ulcers, might lead to hæmorrhage and to perforation. The syphilitic ulcers, he said, had a smooth base covered with lardaceous matter. A reliable diagnosis was very difficult, but when symptoms of gastric ulcer were present without increase of gastric acid, syphilitic ulcer might be suggested. The administration of salvarsan was of no value for the diagnosis. In one instance the diagnosis had been made previous to the operation. Dr. Rumpel had operated upon two cases where, when the stomach had been opened a growth like cancer was found which on microscopical examination proved to be gumma. In the discussion Dr. Nordmann reported that he had operated upon three cases; a phlegmonous infiltration of the surroundings of the ulcers seemed to be characteristic. Two of his cases died, the other recovered, but afterwards died from aneurysm.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 4TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 65; scarlet fever, 1563; diphtheria, 836; enteric fever, 42; pneumonia, 690; puerperal fever, 39; cerebro-spinal fever, 5; acute poliomyelitis, 6; encephalitis lethargica, 57; continued fever, 3; dysentery, 4; ophthalmia neonatorum, 119. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 6 deaths from enteric fever, 54 from measles, 10 from scarlet fever, 65 from whooping-cough, 21 from diphtheria, and 30 from influenza. In London itself there were no deaths from influenza; deaths from whooping-cough numbered 12, and from diphtheria 5.

BOTANIC LABORATORY FOR BEDFORD COLLEGE.—

The new Sargent Laboratory of Plant Physiology at Bedford College for Women, the only one of its kind in London, was opened on July 9th by Lord Justice Sargent. The money for the laboratory was bequeathed by his sister, the late Miss Alice Sargent, who was formerly a student and ardent admirer of Bedford College. The laboratory has a botanic garden attached to it.

Correspondence.

"Audi alteram partem."

THE RIVER AMAZON FOR TOURISTS.

To the Editor of THE LANCET.

SIR,—In the last few years the attractions of the Amazon have begun to interest a considerable number of tourists, and to those who have never visited this section of Brazil the trip from Pará to Manáos cannot fail to be of interest.

It has come to my notice that some British practitioners, on being consulted by their patients as to the advisability of making this trip, give warnings of the Amazon being a region of yellow fever, malaria, and swamps. In all justice to the Federal and State authorities such statements should be contradicted. Yellow fever became extinct in Pará after the anti-yellow fever campaign of Oswaldo Cruz in 1911, and the State of Amazonas has been recorded clean since the end of 1913.

When I arrived in Manáos in 1905 the situation was vastly different; then it was the case that most of the newly-arrived foreigners sooner or later suffered from "yellow jack"—I was an early victim—and malaria was rife all over the town. To-day all is changed and the tourist no longer excites the wonder of the Manauense, nor is the commercial traveller considered to be a brave man for venturing so far up the Amazon. It is a difficult matter, however, to eradicate the old idea of the Amazon being a death's hole; but the health of the foreigner is excellent, and I have only a couple of cases of malaria a year to deal with. Malarial fevers are common, certainly, but they are contracted in regions which the tourists never visit.

Manáos is only about 3·40 metres above sea-level and lies in lat. 3° 08' 30", and long. 59° 59' 27" west of Greenwich. The temperature, while not high for the tropics, is very constant and ranges between 75° and 95° F. in the hot season and 68° and 86° F. in the cooler months; the relative humidity is 63 per cent. to 79 per cent. The temperature in Pará is rather lower and there is more breeze. Both cities were provided with all modern advantages when the "black gold" of the Amazon (rubber) commanded high prices and favourable exchange, and, consequently, the drainage and water systems are good; there are excellent tramways and all the comforts of electric lighting and ventilating. Pará possesses a modern and cool hotel.

It is a matter of regret that more medical men do not visit this country of Wallace, Bates, and Spruce, for it is full of interest. I believe Sir John Bland-Sutton enjoyed his visit, although he did far more sightseeing and observing than the ordinary tourist. I think it would be wise to advise patients to wear clothing suitable for the warmer climate of the tropics—sun helmets are not required—and to keep to a hot weather dietary. This advice is necessary when they leave Pará for the trip up the Amazon to Manáos and encounter a greater humidity as well as leading a sedentary life for the four days on board ship until they arrive at Manáos and can step ashore at a miniature Liverpool landing stage for exercise and sightseeing. I do not recommend pulmonary tuberculosis cases making the tour, and patients with very high blood pressure should be warned not to exert themselves unduly during the hotter part of the early afternoon.

I am, Sir, yours faithfully,

H. WOLFERSTAN THOMAS.

Manáos Research Laboratory, Liverpool
School of Tropical Medicine.

June 8th, 1925.

* * * We may remind intending tourists of the promising field offered by the Amazon Valley for finding new drugs, *videlicet* annotation in our issue for July 4th.—ED. L.

THE PURSUIT OF PURE MILK.

To the Editor of THE LANCET.

SIR,—No one who has any knowledge of the conditions under which milk is produced, distributed, and consumed in this country can dispute the general conclusions of your article on "The Pursuit of Pure Milk." May I be allowed, however, as chief chemist and bacteriologist of the distributing firm responsible for the large portion of London's milk-supply, to controvert a suggestion contained in your remarks on pasteurisation, which may prove misleading. "The basal fact," says your article, "is that at the present time the bulk of the milk consumed in the large towns is pasteurised by processes which are uncontrolled as regards the temperatures reached or the time the milk is held at a high temperature." The implication here and in succeeding sentences is that pasteurisation is a purely casual process of heating, and the phrase "controlled pasteurisation," a few lines lower down in the article, is used seemingly as a synonym for "scientific pasteurisation," as distinct from the commercial significance of the term.

I should like to state categorically that the suggestion, so far as concerns the plants controlled by the United Dairies, Ltd., is entirely unjustified. The milk distributed by the firm's associated companies is pasteurised under a system of control which ensures its being submitted to an even temperature of 145° F. for half an hour. In their plants the holding tanks are provided with an automatic temperature recorder, which affords incontestable proof of the constancy of the heat to which the milk is subjected. An automatic device provides for the release of the milk from the tank at the end of half an hour.

Moreover, our inspectors conduct frequent examinations of the plants to ensure the cleanliness of the apparatus, and samples are taken at every stage of the process.

Milk can be made clean and safe by means of filtration, clarification, and pasteurisation, but milk producers in this or any other country have not yet reached that state of idealistic perfection when clean production will obviate the necessity for these dairy processes.

Until we reach this Utopian state of affairs, pasteurisation is the only method of maintaining a milk-supply which can be truthfully described as "safe." In fact, in such advanced dairying countries as Denmark, Sweden, and many of the United States of America, pasteurisation is compulsory.

It may remain questionable whether in the process of pasteurisation something is lost of the nutritive qualities of the milk, though my own researches have led me to the conclusion that the loss is negligible. What is beyond question is that safety—i.e., freedom from pathogenic organisms—must be our first consideration. In this connexion, with the coöperation of Prof. R. T. Hewlett, of London University, who is consulting bacteriologist to United Dairies, Ltd., I have conducted a series of tests over a period of many months with the most encouraging results. In every case where milk samples (taken from herds in all parts of the country and not from cows especially inoculated for our purposes) have been found tuberculous before pasteurisation, no trace of infection remained after the process.

United Dairies are doing their utmost in all ways to encourage healthy herds and clean production on the farms, but, of necessity, the bulk of this important work must fall to the Ministries of Agriculture and Health.

I may add that Prof. Hewlett desires me to say that he associates himself with all I have said in this letter.

I am, Sir, yours faithfully,

J. D. ROBERTS.

Analytical and Bacteriological Laboratories,
35, Little Russell-street, London, W.C.,
July 7th, 1925.

* * * Our remarks referred to milk consumed in the large towns, not specifically to London, and we have yet to learn that the holder system of pasteurisation is

applied throughout the country. The essential point is that, apart from control by Government regulation, it is open to anyone who supplies milk to alter the temperature to be employed or the length of time during which it is maintained, or to use or not to use a holder type of pasteuriser. The milk is not sold as "pasteurised" milk and therefore is not subject to inspection by the Ministry or the local authority. Such pasteurisation can properly be spoken of as uncontrolled. The effect of pasteurisation in retarding efforts to obtain a clean milk-supply is adequately dealt with by Dr. Savage in his special article.—ED. L.

THE ATTRACTIONS OF THE ROYAL NAVAL VOLUNTEER RESERVE.

To the Editor of THE LANCET.

SIR,—May I ask your assistance in calling the attention of the younger members of the medical profession to the attractions offered by service in the Royal Naval Volunteer Reserve?

The R.N.V.R. consists of seven divisions: London, Scottish, Tyne, Mersey, Bristol, Sussex, and Ulster. The establishment provides for 205 medical officers; of whom 50 are on List I. and the remainder on List II., and in addition 28 dental surgeons. Each category has to serve 28 days at sea during their first year of service and subsequently 14 days biennially either afloat in one of H.M. ships or in a naval hospital or dépôt. Those on List I. have in addition to attend periodically at the headquarters of the division to which they are attached for the examination of recruits and other medical duties. The age of entry is from 21 to 32 years. Provision is also made for the entry as surgeon sub-lieutenants of students from 19 to 26 years who have passed their intermediate examination in anatomy and physiology. Promotion is on the same basis as in the Royal Navy except that no examinations are held. During training medical officers receive the naval pay of their rank, and £50 is provided for the expenses of uniform on joining, or, in the case of probationary officers, on confirmation in rank.

The service affords a unique opportunity for seeing the life of the Royal Navy, as well as providing every two years a most interesting experience free of all expense and well paid for the duties required, whether afloat or ashore. Applications for commissions should be addressed to the commanding officer at the headquarters of the nearest division, from whom full particulars can be obtained.

I am, Sir, yours faithfully,

J. BRUCE RONALDSON,

Surgeon-Commander, R.N.V.R.

H.M.S. *President*, Victoria Embankment, E.C. 4,
July 13th, 1925.

PRELIMINARY TRAINING IN DOMESTIC ARTS, KING'S COLLEGE HOSPITAL.

To the Editor of THE LANCET.

SIR,—Twelve months ago THE LANCET kindly expressed an interest in the establishment of a course of domestic arts in connexion with the preliminary training school which was opened at the beginning of September. Perhaps you will allow me to report upon the points upon which some doubt was expressed. It has been proved quite clearly that the two sets of pupils have been, in the American phrase, which you quoted, "good mixers." Those who have taken the course without any idea of becoming nurses have taken a keen interest in the scientific, practical, and domestic sides of the course, and their influence has been distinctly helpful.

The suggestion that the pupils would be taking the place of paid domestic help in the pupil nurses' home is one which is not supported in fact. All pupils, whether nurse pupils or not, have certain duties to

perform under supervision as part of their training; that is part of the curriculum and without it the course could hardly be said to fulfil its function. Paid domestic help is made use of for those parts of the work which it is neither desirable nor helpful for the pupils to carry out, and the amount and expense of such assistance employed are increased by every additional pupil, whether she be in training for the nursing school or not.

THE LANCET made a somewhat cruel insinuation against the girl of the present day in suggesting that the opportunity to appreciate some of the joy of service would have no attraction for her. The opportunity to see something of the work of the hospital and the privilege, which also THE LANCET doubted, of taking some part in its work, have, in fact, been greatly appreciated by the pupils, and have, it is believed, exerted a beneficial influence on those who have undertaken the course.

I am, Sir, yours faithfully,

C. E. A. BEDWELL,
House Governor.

July 13th, 1925.

** We are happy to publish Mr. Bedwell's letter. The annotation will be found in THE LANCET of 1924, ii., 504, under the title "Housewifery in a Hospital Milieu" and Mr. Bedwell does not reproduce the words we used.—ED. L.

Obituary.

ALEXANDER JOSEPH MCAULEY BLAYNEY.
F.R.C.S.IREL.,

SURGEON TO THE MATER MISERICORDIÆ HOSPITAL, DUBLIN.

THE tragically sudden death of Mr. Alexander Blayney on Sunday last, July 12th, has caused deep grief in the medical profession of Dublin and Ireland. He had recently had an attack of influenza, and while walking with his wife and children across the Portmarnock golf links, he suddenly fell to the ground. Medical aid was to hand at once, but death had apparently been instantaneous. He was 56 years of age.

Alexander Blayney was born in Co. Antrim and educated in Belfast and in the Catholic University, Dublin. He had a distinguished career in the Royal University, winning, among other honours, the studentship in biology. He took his medical degrees in 1893, and became a Fellow of the Royal College of Surgeons in Ireland in 1898. He held for a time the chair of Biology in University College, Dublin, but his bent was toward surgery, and early in his career he became one of the surgical staff of the Mater Misericordiæ Hospital. Since the foundation of the National University in 1908 he was assistant to the professor of surgery in the Dublin College. He was a Member of Council of the Royal College of Surgeons in Ireland for many years past and could easily have reached higher honours in the College had he sought them. He held, from time to time, examinations both in the Royal College of Surgeons and in Trinity College, Dublin. During the war he served in the 83rd (Dublin) General Hospital, with the rank of major.

For many years past Mr. Blayney had one of the largest operating and consulting practices in Ireland. He had a wide and accurate knowledge of his subject, and was endowed with a judicious mind and even temper, with the result that his diagnosis was careful and sound, and very rarely was he led into error. In operation he was cool and resourceful. Any practitioner who once sought his help in a difficult case rarely thought of looking for another surgeon ever after. Though his ability as a surgeon was recognised by both the profession and the public, Mr. Blayney never took the prominent position in the profession to which his talents entitled him. He sought retirement

and avoided publicity. He never sought the chair of his College in spite of the pressure of his friends, but it was understood that he would in the near future have allowed his name to go forward. Apart from his profession he was a man of wide reading and much culture, loving literature, music, golf, bridge, and conversation. Reserved with strangers, and always modest and retiring, something more than a casual acquaintance was required to discover the fund of humanity, humour, and wisdom that lay behind his quiet manner. His death was so sudden and unexpected that in the sense of the loss of a loved friend his colleagues cannot yet realise how much Irish surgery has suffered.

JOSEPH BOWER SIDDALL, M.D. ABERD.

Dr. Joseph Bower Siddall, who died at Great Malvern on July 4th, at the age of 85, was in the real sense of the word a pioneer of medicine, for in 1868 he went to Japan as medical officer to H.B.M.'s Legation. There, in association with the late Dr. Willis, he had charge of the Japanese hospitals in Yokohama, and later in Yedo (now Tokio) during the War of the Restoration in 1868-69. He established the first hospital, called the Dai Biyoin (or the Great Hospital) in Yedo in 1868, where he accomplished his cherished aim of introducing hygienic methods into the Japanese military service. He put his experience on record in an article published in Vol. V. of St. Thomas's Hospital Reports. He so forcibly advocated the value of vaccination in Japan that the Mikado issued an order that the whole of the population was to be vaccinated, with the result that in 15 years small-pox was virtually stamped out. Previously no measures had been adopted to combat this disease, which was very rife. For his services to Japan he was awarded the Order of the Rising Sun by the Mikado, but it was not until 1909 that he received the permission of the British Foreign Office to wear the Order. He had the distinction of being the first foreigner to receive it. Dr. Siddall was a fine cricketer in his day, and his golf-handicap was four. He played cricket for the Gentlemen of England, and as he stood 6 ft. 2 in., and was broad in proportion, he was naturally a hard hitter. He was proud of the fact that he had smashed the clock at the Oval; he occasionally played in the same eleven as the "Three Graces." At the Royal North Devon Golf Club, of which he was one of the founders, he used to tell how Mr. J. H. Taylor as a boy acted as his caddy. Dr. Siddall qualified from St. Thomas's Hospital in 1864 as M.R.C.S. Eng. and L.S.A. He afterwards went to Aberdeen, where he took the M.D. with highest honours.

On his return from Japan he practised for a time at Ross-on-Wye, retiring about 35 years ago to reside in Devonshire and latterly in Malvern. Dr. Siddall married Mary Elizabeth, second daughter of Charles Binns, J.P., of Claycross Hall, Chesterfield, who predeceased him some years ago.

HAROLD CLIFFORD, M.B. LOND., F.R.C.S. EDIN.

Dr. Clifford, whose death took place at his residence, St. John-street, Manchester, on July 8th, was well known as a gynaecologist. Son of the late Dr. John Clifford, the veteran Baptist preacher, Dr. Clifford settled in Manchester 25 years ago after taking a medical course at University College, London, where he was house physician at the hospital. Qualifying in 1897, he took the M.B. Lond. in 1899 and the F.R.C.S. Edin. in 1905. He was connected with the staff of St. Mary's Hospital for many years, and since 1913 was honorary surgeon and gynaecologist at the Royal Salford Hospital. He lectured on clinical obstetrics at the Victoria University of Manchester, and was an external examiner in midwifery at Queen's University, Belfast. Dr. Clifford had been in indifferent health for some months, but his death was sudden and took his many friends by surprise.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, JULY 9TH.

Mental Deficiency Bill.

THE Mental Deficiency Bill was read a second time. This Bill has already passed through the House of Commons.

HOUSE OF COMMONS.

WEDNESDAY, JULY 8TH.

Vaccination and Chicken-pox.

MR. BROMFIELD asked the Minister of Health whether, in view of the difficulties which existed in regard to the diagnosis of mild small-pox and chicken-pox, he would give instructions, in cases where chicken-pox was made a notifiable disease, for the condition of the patients as regards vaccination to be stated on the form of notification, with a view to statistical records being inserted in the annual reports of the medical officers of health showing the total number of vaccinated and unvaccinated chicken-pox cases notified in each year.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: The answer is in the negative. My right hon. friend is advised that a mere statement on the notification form as to the vaccinal condition of such patients would not be of any material assistance in arriving at an accurate diagnosis, and as it has never been suggested that vaccination affords any protection against chicken-pox, he does not consider that statistical records as to the vaccinal condition of patients suffering from that disease would be of value.

THURSDAY, JULY 9TH.

Provision of Massage for Disabled Men.

Captain BOWYER asked the Minister of Pensions whether in future he would utilise the services locally in rural areas of qualified masseurs and masseuses for the treatment of disabled men, and thus save the time of the men and unnecessary suffering to the disabled.—Major TRYON replied: It is the experience of the Ministry that massage is most effectively administered in the interests of patients when carried on at a clinic under proper medical supervision. Where, however, this treatment can be efficiently administered otherwise, and attendance at a clinic would involve serious inconvenience and hardship to the patient, alternative arrangements are allowed.

Distribution of Health Insurance Surpluses.

Sir HENRY CAUTLEY asked the Minister of Health under what authority and for what reason he prohibited approved societies from distributing the surpluses, over and above the requisite reserves, disclosed by the recent valuations in extra cash benefits in excess of 5s. for sickness benefit; and whether, considering the difficulty in devising schemes for other benefits in the case of the small societies such as those in the Sussex County Association, he would allow all the surpluses, except requisite reserves, to be distributed in extra cash benefits.—Mr. NEVILLE CHAMBERLAIN replied: In accordance with a decision of the National Health Insurance Joint Committee, approved societies have been recommended in the interests of their members not to adopt extra cash benefits in excess of 5s. a week for sickness benefit unless they are also making reasonably adequate provision for treatment benefits. Schemes complying with the latter condition, and providing for an increase of over 5s. in sickness benefit, have already been sanctioned for several societies, including three that are constituent societies of the Sussex County Association. It will be seen, therefore, that there has not been a general prohibition of the kind suggested in the question.

Extension of Health Insurance Membership.

Mr. DENNISON asked the Minister of Health the number of insured persons who were unable to claim the extension of National Health Insurance membership under The Prolongation of Insurance Act, 1921, owing to the fact that they had not paid the necessary contributions in the two contribution years ending July, 1920, or in any other respects had not complied with the statutory conditions of the Act; and if such persons would be disqualified from claiming the benefits in accordance with the provisions of the Widows', Orphans', and Old Age Contributory Pensions Bill.—Mr. NEVILLE CHAMBERLAIN replied: Cessation of insurance, otherwise than by death, may be due to a variety of causes, and particulars are not available at headquarters to show, with regard to the members of between 8000 and 9000 approved societies and registered branches, how far cessation may have been due to a particular cause such as that to which the hon. Member refers. With regard to the second part of the question, it will not be possible under the

Widows', Orphans', and Old Age Contributory Pensions Bill for a claim to benefits in respect of his own insurance to be made by a person who is out of insurance at the time of the claim.

Pollution of the River Lee.

Captain GARRO-JONES asked the Minister of Health how long he anticipated it would be before the measure he contemplated for improving the condition of the River Lee would take effect; whether these measures, when completed, would entirely remove the nuisance of crude sewage; and whether, in order to relieve the anxiety of those to whom this nuisance caused risk to health, he could undertake to press forward the measure with the utmost expedition.—Mr. NEVILLE CHAMBERLAIN replied: The two places which most affect the state of the river at Hackney are Enfield and Edmonton. The new works at the former are expected to come into operation in a few weeks. The first instalment of the new measures at the latter place should come into operation in about six months time; I am informed that the work is being pushed forward. I am advised that when these works and those at Walthamstow and Leyton come into full effect, the present state of the river should be remedied.

Deaths from Measles.

Mr. FORREST asked the Minister of Health the total number of cases of measles for the last half-year and the total of deaths resulting therefrom; and whether his department could express any reason for the prevalence of this malady in the British Isles.—Mr. NEVILLE CHAMBERLAIN replied: Measles is not generally notifiable in England and Wales and I am, therefore, unable to give the total number of cases of this disease which occurred during the last half-year. The number of deaths from measles in England and Wales during the first quarter of the present year was 1626, but this is a provisional figure and the number of deaths during the second quarter is not yet available. I am advised that no specific reason can be given for the prevalence of this disease, but that there is no evidence of exceptional incidence in the country as a whole.

Administration of Maternity Benefit.

Colonel ENGLAND asked the Minister of Health whether his attention had been called to the statement of the late principal medical officer of the Ministry of Health attacking the administration of the maternity benefit by the approved societies; and whether the preference expressed for its administration by local public health authorities was entertained by his present advisers.—Mr. NEVILLE CHAMBERLAIN replied: The statement to which I assume that my hon. friend refers was made, not by a late officer of the Ministry of Health, but by the former medical officer of the Local Government Board. The matter in question is within the purview of the Royal Commission on National Health Insurance, and I propose to await their report before expressing any opinion upon it.

High Mortality in Market Drayton.

Mr. GRIFFITHS asked the Minister of Health whether he had received a reply from the Shropshire county council with regard to certain suggestions arising out of the report of his inspector as to the high mortality of Market Drayton, which was communicated to that council; and, if so, whether he would now publish the report, in order to assist in a movement to save the infants in the district in question.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, I would refer the hon. Member to the answer which I gave on July 2nd.

The Spahlinger Treatment of Tuberculosis.

Mr. CHARLES EDWARDS asked the Minister of Health whether he had seen the report of the medical men who were Members of this House who had been investigating the Spahlinger treatment and its effects; and whether, seeing that it was so favourable to that treatment, he would take steps to ensure that it should be made available for sufferers in this country.—Mr. NEVILLE CHAMBERLAIN replied: I have not yet seen this report, but I understand that the conclusion reached is that a *prima facie* case has been made out for the Spahlinger treatment, and that the report recommends that an exhaustive trial of the remedy should be made. As regards the second part of the question, I may point out that I have repeatedly stated that I am anxious to arrange for a scientific investigation of this method of treatment in this country as soon as the materials are made available. I have been waiting for three years for these materials, but I am still without information as to when they are likely to be forthcoming, and I understand that the report referred to contains no assurance that the treatment is or can soon be available in this country. Some weeks ago, however, I arranged for two of the medical officers of my department to pay a further visit to Geneva for the purpose of conferring with Mr. Spahlinger on this and other questions.

MONDAY, JULY 13TH.

Tubercle Bacilli in Milk.

Mr. VERNON DAVIES asked the Minister of Health if he had received a copy of the resolution passed at the eleventh annual conference of the National Association for the Prevention of Tuberculosis to the effect that a considerable proportion of tuberculosis in childhood is due to infection through the presence of tubercle bacilli in milk offered for human food, and urging His Majesty's Government to render effective the provisions of the Milk and Dairies Act; and whether he was prepared to act upon this suggestion.

—Sir KINGSLEY WOOD replied: My right hon. friend has seen the resolution referred to. The Milk and Dairies Act of 1915, which deals with this subject, will be brought into operation on Sept. 1st next.

Unregistered Midwives.

Mr. BENNETT asked the Minister of Health whether representations had been made to him, and if so, by whom, in favour of the elimination of unregistered practising midwives; and whether, in that case, he could state the views of the department on the matter and the likelihood of obtaining an adequate number of registered midwives.

—Mr. NEVILLE CHAMBERLAIN replied: Yes, Sir, I have received many such representations from local supervising authorities and other bodies. I am in favour of the elimination of unregistered midwives, and I do not anticipate difficulty in obtaining an adequate number of registered midwives. I have it in mind to deal with the matter in a Bill to amend the Midwives Act which I propose to introduce as soon as other commitments allow.

TUESDAY, JULY 14TH.

Midwives for Insured Persons.

Colonel DAY asked the Minister of Health whether he was prepared to provide contributions from the funds available under the National Health Insurance Act towards district nursing associations employing qualified midwives to attend insured persons, in view of the importance of these associations among health services.

—Mr. NEVILLE CHAMBERLAIN replied: An approved society is entitled to devote part of its disposable surplus on valuation to making payments towards the cost of providing nursing for its members, and may also make subscriptions or donations from its benefit fund for the support of district nurses. There is not, however, any provision in the National Health Insurance Act for the making of payments for the specific purpose of securing the attendance of midwives on insured women at confinement, and before considering the desirability of amending legislation in this direction I must await the report of the Royal Commission on National Health Insurance.

Sale of Tainted Food.

Colonel DAY asked the Minister of Health whether he was aware that recently in the borough of Lambeth it was found that a local meat retailer boiled pork and beef in a portable copper situated in a yard full of flies and other insects attracted by neighbouring dustbins, and that the medical officer of health traced 24 cases of food poisoning to this tainted source; and would he consider introducing legislation to give local authorities increased power in order to deal with such practices which were dangerous to public health.

—Sir KINGSLEY WOOD replied: My right hon. friend has received a copy of the report of the medical officer of health on the case to which the hon. and gallant Member refers. He is considering what steps may be practicable and desirable with a view to regulating the conditions under which food is prepared.

IRISH FREE STATE: MEDICAL MEN AS CANDIDATES FOR THE SENATE.—Our Dublin correspondent writes: The names of a few medical men are included in the panel of candidates from whom 19 vacancies in the Senate are to be filled in September. Among them are Mr. H. L. Barniville, F.R.C.S.I., an outgoing senator who seeks re-election; Sir Arthur Chance, a past President of the Royal College of Surgeons in Ireland; Mr. Denis Kennedy, F.R.C.S.I.; Mr. P. McCarten, F.R.C.S.I., formerly a member of the Dail; and Dr. Anthony McBride, of Castlebar.

NORTH PERSIAN FORCES MEMORIAL MEDAL.—Captain W. H. Dye, R.A.M.C., has been awarded this medal for the year 1924 for his paper Schistosomiasis and Splenomegaly in Central Africa, published in the *Journal of the R.A.M.C.* of September, 1924. At the time this work was done Captain Dye was seconded from the Royal Army Medical Corps and was doing duty under the Colonial Office in Nyasaland. This is the second award of a medal to be given annually for the best paper (reaching a certain standard) on tropical medicine or hygiene published during the preceding 12 months by any medical officer in the Services of under 12 years' seniority.

Medical News.

UNIVERSITY OF DURHAM.—At Convocations held on June 30th and July 1st the following medical degrees were conferred:—

Doctor of Medicine.—John F. C. Braine, Jabez E. Dainty, Thomas Ruddock-West, Eleanor H. Russell, Harold Williamson (*in absentia*), George Hurrell, Mona Kirkhouse and Eric H. Shaw.

Doctor of Medicine for Practitioners of 15 Years' Standing.—James Ross, Albert Turner, Henry S. Brown, and Philip T. Harper.

Bachelor of Medicine and Bachelor of Surgery.—Drummond R. F. Bertram, Frank H. Blackburn, Nora E. Coltman, Eric V. Griffiths, John T. Holliday, Marjory G. T. Jacka, Ethel G. Potts, Francis E. Stabler, Stuart C. Stonier, Reginald Wear, Charles W. Arnot, Abraham Brodie, John Brown, Alfred Charlton, John R. Garson, Austen H. Holmes, Sinclair Hughson, Hirsch Levy, James D. W. McCracken, Donald W. MacLaren, William C. Pinkney, Arthur de Redder, Walter Toward, and Charles C. Ungley.

The following received the Diploma in Public Health (D.P.H.):—

Siegfried Annecke and Harold C. Simpson.

The following received the Licence in Dental Surgery (L.D.S.):—

Thomas E. Coulson, Wilfred A. Gale, Donald Gibson, Elsie L. Peet, and Norman Wilkinson.

At the Third Examination for the degrees of Bachelor of Medicine and Bachelor of Surgery the undermentioned candidates satisfied the examiners in the following subjects:—

Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Elementary Bacteriology.—Oswald C. Dobson and William Irving (with second-class honours), Ronald E. Alderson, Max Davison, Joseph Furnan, William R. S. Good, David Gamsu, Rebecca Harbit, Douglas E. Hearn, William B. Hicks, Gerald Holmes, Dennis S. Jackson, Thomas F. Jarman, Maurice Levi, Cyril Mason, Gilbert McLaren, George N. Myers, Harry P. Nelson, Leslie D. Nelson, Eleanor Patterson, Hugh C. S. Pimblett, Edward Porteus, Victor B. Purvis, Cyril F. Richardson, Francis H. Robson, Gibson Salisbury, and Stanley W. Smith.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful in the undermentioned subjects:—

DEGREE OF M.D.

S. B. Herd, Elizabeth Hunt, G. W. Phillips, and D. Riding.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—*†Gwyneth Griffith and †G. McNichol.

Class II.—†L. J. A. Loewenthal, †J. C. Ross, and *C. E. Unsworth.

* Distinction in Surgery. † Distinction in Obstetrics.

‡ Distinction in Medicine.

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part III.—C. P. Allen, A. T. Ashcroft, H. M. Boston, C. L. Copeland, N. L. Corkill, J. L. Donnelly, L. Earlam, Sybil O. Edwards, W. Emdin, M. Fisher, C. J. S. Garton, M. Goldberg, I. Gordon, J. Graham, Frances M. Greenhalgh, Dorothy M. Hanson, C. A. Harris, Beryl M. Hawthorn, J. C. Heal, F. C. S. Hinsbeeck, R. E. Horstall, S. Howard, J. E. Howie, E. Hughes, F. Hughes, F. P. Irvine, Elvy I. Johnstone, R. C. Jones, D. Katz, S. M. Katz, B. Krikler, J. E. S. Lloyd, W. J. Lloyd, T. R. E. Longton, H. McGrath, Isabel McKee, D. J. T. Magowan, K. N. Mawson, E. Miles, D. H. Mills, E. L. Murphy, Irene M. Neal, Winifred A. Nicholson, J. R. Oddy, H. Peaston, J. W. Reid, Miriam Roskin, Margaret E. Thomas, J. J. du Toit, J. Unsworth, Rosalind Vacher, B. J. van de S. de Villiers, and F. W. Yates.

Part II.—J. H. Boulton, *J. L. Clegg, G. S. Clouston, K. McL. *Cobban, K. Edmundson, R. W. Eldridge, A. B. Follows, J. F. Galloway, Elinor M. Gelling, *E. E. Glenton, L. S. Goldman, *I. Gurland, Elizabeth M. Harding, D. G. Henry, Mary Hope-Simpson, *H. E. Hughes-Davies, E. Hulme, B. S. Jarvis, T. A. Jermy, A. N. Jones, *J. S. Logan, M. A. Lombard, D. B. Macaulay, J. C. McFarland, G. McLoughlin, S. G. Massey-Lynch, A. D. Polonsky, D. E. Pritchard, Muriel S. Roberts, A. V. Russell, N. R. Sheridan, Alfreda H. Slater, †G. D. Thompson, D. P. de Villiers, J. E. Wallace, R. G. Walmsley, †Kathleen M. Ward, A. K. Wilson, and Nora M. Wilson.

* With distinction in Public Health. † With distinction in Forensic Medicine and Toxicology.

Part I.—W. G. Brookes, K. M. Cobban, N. J. Crawford, W. A. Davies, W. E. Hargreaves, S. P. Meadows (distinction in Pathology), J. N. Parrington, Ivy H. Rowlands, N. P. Slade, E. S. Smith, and G. D. Thompson.

DEGREE OF M.H.

First (Part I.) Examination.—B. L. Davis.

DIPLOMA IN PUBLIC HEALTH.

J. G. L. Jones, Dorothy G. E. Potter, Frances Weightman, and D. A. Woodeson.

UNIVERSITY OF MANCHESTER.—The Council of the University and the board of management of the Manchester Royal Infirmary have instituted a new laboratory for clinical investigations. The laboratory, which is located in the Royal Infirmary, will be placed in charge of a Director, who will have the status of a lecturer in the University. Mr. W. M. Roberts, M.Sc., M.B., Ch.B. Manch., who has been appointed as Director, at present holds the position of assistant lecturer in chemical pathology. The following appointments have been made: Lecturer in Anatomy: Mr. David Stewart. Lecturer in Applied Anatomy: Mr. R. S. Paterson. Lecturer in Systematic Medicine: Dr. T. H. Oliver. Lecturer in medicine for Dental Students: Dr. C. H. Melland. The following awards have been made: Gold Medal for M.D. Thesis: W. M. Roberts; commendation for M.D. Thesis: A. M. Jones, Donald Ramage, and J. G. Woolham. Harling Fellowship: J. West; Prof. Tom Jones Memorial Surgical Fellowship: Leslie Morris; Platt Physiological Scholarship: W. H. Newton; Tom Jones Exhibition in Anatomy: F. N. Marshall.

At examinations held recently the following candidates were successful in the subjects indicated:—

FINAL M.B. AND CH.B. EXAMINATION.

*F. H. Smirk (first-class honours), N. W. Bolton and G. H. H. Booth (second-class honours), A. R. Adley-Redfern, Solomon Bernstein, Lilian Bond, Geoffrey Coope, T. A. Danby, A. A. Davis, †N. E. Delaney, †Kathleen Dickinson, Madge E. Edwards, Mary Evans, C. R. Fielding, Miriam Florentin, E. A. Gerrard, Mary Harburn, James Haslam, †May Johnson, Walter Johnson, Barbara M. Knight, G. F. Langford, G. H. March, C. T. Marshall, E. A. Marson, Ethel Morris, William Mottershead, †S. L. Mucklow, Archer Pearson, Henry Penman, †Joan Robinson, T. W. Rothwell, M. R. Sagar, N. F. Seed, W. H. Shepley, Joseph Shlosberg, Lois Stent, Jane B. Stubbs, Samuel Whalley, K. K. Wood, P. B. Wood, Reginald Wood, N. A. J. Young.
* Distinction in Medicine. † Distinction in Forensic Medicine.

Forensic Medicine and Hygiene and Preventive Medicine.—C. H. Bamford, Frances H. Bowden, John Crook, L. F. Evans (distinction in Forensic Medicine), Agnes G. Smiley, and J. C. Wilson.

Medicine.—Frances H. Bowden.

Hygiene and Preventive Medicine.—H. H. Bullough, I. H. Freedlander, R. M. Pearce, and A. D. Shubsachs.

Obstetrics and Surgery.—Louise Aronovich, Marion L. Bainbridge, A. R. Barber, J. R. Beal, Peter Bester, R. H. Blackburn, Florence M. Blades, Agnes Bodoano, Lillie M. Burton, S. J. Firth, T. S. Hanlin, F. S. Hawkins, Barnett Hirsch, †R. L. Holt, John Hunt, T. J. Kay, H. B. Kilroe, W. D. Mitton, R. J. Owen, Raphael Shaffer, W. S. Slater, Graham Stenhouse, Olive de la W. Turner, and E. J. Warburton.

Obstetrics.—†H. K. Ashworth, Zaky Hanna, and Harry Pigott.

‡ Distinction in Obstetrics.

THIRD M.B. AND CH.B. EXAMINATION.

Pathology.—R. S. Abraham, Doris Bernard, J. W. Brooks, Louie J. Burton, Margaret Egan, Arthur Hancock, Ernest Heard, G. L. Normington, I. M. Preston, Nora Ridehalgh, C. D. Roff, R. F. Sheppard, and Donald Starr.

Pharmacology.—S. K. Appleton, Dorothy Arning, Harold Arstall, A. H. Baker, Dorothy M. Bradley, H. J. Brennan, Agnes N. Buckley, M. A. Chamberlain, E. B. Davies, Ralph Edmondson, Muriel M. Edwards, Amy H. Herbert, I. M. Hughes, J. H. Jones, Morris Levine, J. A. Longworth, Jean M. Marshall, H. E. Martin, J. S. Miller, Robert Newton (with distinction), Stanley Nowell, R. P. Osborne, G. H. Racklyeft, Norah Regan, Marshall Robinson, S. L. Rowley, Eleanor H. Schill, Lucy Stokoe, Alfred Thomas, F. F. Waddy, and Josephine Walmsley.

DEGREE OF CH.M.

J. A. Pantton.

DIPLOMA IN BACTERIOLOGY.

Marion H. Black and G. E. Shaw.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

W. G. Thomson and C. B. V. Walker.

UNIVERSITY OF BRISTOL.—At examinations recently held the following candidates were successful:—

FINAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Part I. (including Forensic Medicine and Toxicology).—Helen M. Aldwinckle, Cecily France-Hayhurst, Frederic W. T. Hughes, Ernest May, Richard E. Satchwell, and Stanley P. Taylor.

Part II. (completing examination).—David H. Beatson, Harry W. Braxington, Bessie V. F. Dawkins, Charles H. Durnford, William S. Ormiston, Maurice E. J. Packer, Yolande de la Pasture, Cecil P. Porter, and Thomas W. Ware.

Group II. (completing examination).—Elizabeth E. Benson, Margaret P. Posthuma, and Kathleen M. Willmore.
Group I. (completing examination).—Charles F. R. Killick.

EXAMINATION FOR DIPLOMA IN PUBLIC HEALTH.

Part II. (completing examination).—Frederic P. Mackie and Norah A. M. Rodger.

FINAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.
Christopher S. Cossam and Sydney Phillips.

UNIVERSITY OF LEEDS.—At the Summer Graduation ceremony on July 4th the following degrees were conferred in the Faculty of Medicine:—

M.D.—Arthur Massey and Harry A. Sinson.

Ch.M.—John T. Blackburn (with distinction).

M.B., Ch.B.—With second-class honours: David R. Allison, Albert Hemingway, Matthew Masser, James L. Moorhouse, James H. O'Donnell, Michael Rabinovich, Rosamond E. Roper, and Geoffrey W. Taylor. Ordinary degree: Maurice Backwell, Leslie V. Broadhead, Isaac Cainer, Francis R. Curtis, John Duncan, John Ewing, Wilfred S. Flowers, Glen Gorstige, John R. S. Greenwood, Philip V. Hardwick, John L. Hartley, Fannie Hirst, James C. Lamont, Sam Leviten, and Edith V. Oliver.

UNIVERSITY OF ABERDEEN.—At the Graduation ceremony held on July 9th the honorary degree of Doctor of Laws (LL.D.) was conferred on Dr. John J. R. Macleod, F.R.S., Nobel Prizeman in Medicine, 1923; Professor of Physiology at the University of Toronto. The following degrees were also conferred:—

DOCTOR OF MEDICINE.

*Robert Cruickshank, *John B. Duguid, †Cecil B. Hogg, Arthur A. Hearne (in absentia), and Archibald C. Irvine (in absentia).

* Awarded highest honours for thesis. † Awarded commendation for thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

Douglas Archibald, Horace A. Barker, Catherine H. Baxter, Alexander Brooks, William B. B. Brown, William Bruce, Hew M. N. Calder, Hugh M. Crombie, Alexander Cruickshank, Williamina Cruickshank, Marjorie J. M. Dow, Mary M. Farquhar, William Ferguson, Samuel H. Fine, William Gavin, Henderson Gow, *Walter Graham, *Dorothy M. Harris, Douglas C. Henderson, William F. Ingram, Donald B. C. Lawson, James H. McDonald, John C. MacFarlane, George R. Mackay, John B. Mackay, George N. McLaren, Charles E. Mathieson, Graeme M. M. Menzies, William Menzies, James Murray, Alexander D. Rankin, Archibald C. Reid, Hugh L. Rettie, John M. Ritchie, Grace M. Robinson, Ephraim Sacks, Lyndsay R. D. Smith, *Williamina Stephen, *Gordon Thow, Adam N. S. Watt, Enid M. O. Will, Douglas Wilson, *Edith B. Wilson, and James Wright.

* Completed Final Examination with distinction.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Jurisprudence and Hygiene; Pathology and Bacteriology.—Edmund P. N. M. Early (passed on high marks), Shirley D. K. Roberts, Menzies L. McCauley, Gerald S. Smyth, Robert S. F. Hennessy, Albert Sachs, Robert A. J. Holmes-Ievers, Martinus G. J. Booyens, George S. Gardner, Edward W. Bingham, Arthur N. B. Odbert, John O. Bennett, Norman J. U. Mather, John H. Stephens, Christiaan de W. Meintjes, Daniel A. O'C. Quinlan, Herbert Nelson, Hubert C. Weir, John C. Collins, and John B. Patrick.

Part II., Medicine (M.B.).—James E. McCauley, Roy K. Carson, Gladys M. A. Lowry, James W. Wallace, Alexander D. M'Lean, Hope Trant, James J. Cusack, Edward C. Dudgeon, Harry Waters, William H. Coen, Joseph V. Pincus, Kathleen M. Ball, Johan N. S. Gouws, Carol R. J. Boland, Harris Tomkin, George R. L. Jordan, John E. Stokes, Edwin S. A. Crawford, John St. Clair, Philip B. Robinson, Charles L. Taylor, David N. Power, Norah M. Smith, Gerard A. A. Powell, and William O. Warrington.

Surgery (B.Ch.).—Charles F. D. McCalldin, O'Donel T. D. Browne, Joseph R. Gregory, William C. Somerville-Large, Thomas C. Foster, Robert L. Forsyth, Thomas W. MacDowell, Oliver Chance, James W. Wallace, Ralph A. Webner, William Gallagher, James Dick, John F. Wilde, William P. E. M'Intyre, Hope Trant, Mary Galvin, Augusta M. Young, Mary C. Livingston, Launcelot W. R. Haskins, Kathleen D. Murison, Agnes L. Kelly, Noel G. M'Auliffe, Norman M. Greaves, Harry Waters, Annie T. Deane, and Gideon J. Joubert.

Midwifery (B.A.O.).—Seymour F. Heatley, Richard G. Keays, Ransome M. Allardyce, and John H. M'Lean (passed on high marks), William B. Roantree, Edward M'Alpine, James W. Bowden, Jack M. Selkon, Nancie N. Lowther, Robert Kahn, William Russell, Stella C. Ross, Jane D. Fulton, Henry J. Roche, William Magowan, Daniel J. Roux, Frances E. O'Connor, Philip F. Palmer, Gladys L. Craig, George A. Walmsley, George R. L. Jordan, Aileen Fair, and Rachel E. Porter.

DIPLOMA IN PUBLIC HEALTH.

Part I., Chemistry, Bacteriology, Physics, and Meteorology.—William F. Sheil.

FINAL DENTAL EXAMINATION (B.DENT.SC.).

Dental Surgery and Pathology; Dental Mechanics and Metallurgy; Orthodontics.—Thomas M. Joyce.

Honorary Degrees.—On June 26th the honorary degree of Master in Surgery was conferred on Drs. George W. Crile and Charles H. Mayo, the public orator, Sir Robert Tate, presented the candidates to the University.—The degree of Doctor in Science was conferred on Prof. James P. Hill, F.R.S., and Sir Frederick G. Hopkins.

UNIVERSITY OF LONDON.—In the Faculty of Science the Senate awarded on June 24th the degree of Ph.D. to Annie D. Hoffert, a student of the Lister Institute of Preventive Medicine.

UNIVERSITY OF GLASGOW.—At the graduation ceremony on July 3rd Dr. Archibald J. Cronin received the degree of M.D. with high commendation.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—There will be a late afternoon course in the diagnosis and treatment of the more common diseases of the nervous system. The course will take place in the out-patient department (73, Welbeck-street) of the West End Hospital, and the lectures and demonstrations will be illustrated by cases. There will be a vacation course at the Prince of Wales's General Hospital (N.E. London Post-Graduate College, Tottenham N.) from August 3rd to 15th. During the two weeks, a ticket for either of which may be taken separately, there will be morning and afternoon sessions from 10.30 A.M. to 5.30 P.M. Each day will include clinical demonstrations, clinics, and clinical lectures, and the whole of the hospital practice will be available for study. The Queen Mary's Hospital, Stratford, will also give an intensive course on similar lines to that at the Prince of Wales's Hospital, from August 24th to Sept. 5th. Special facilities will be given at the latter hospital for the study of gynaecology and obstetrics. Throughout the month a special course will be given at the All Saints' Hospital for Urology. There will be clinical demonstrations daily and a special lecture every Wednesday dealing with the various phases of the disease. Copies of each of the above-mentioned syllabuses, as also the general programme of work, may be obtained from the Secretary, 1, Wimpole-street, W.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council of the College, held on July 9th, Sir John Bland-Sutton in the chair, Mr. James Sherren and Sir John Lynn-Thomas, having been duly re-elected and having made the declaration prescribed by the Charter of 1800, took their seats as members of the Council. Mr. Arthur Burgess having been elected and having made the declaration took his seat as member of Council. Mr. Graham S. Simpson having been introduced and made the necessary declaration was admitted a member of the Court of Examiners. Mr. Cecil F. Beadles was appointed Pathological Curator of the Museum for the ensuing year. Mr. R. H. Burne was re-elected Physiological Curator and Sir Frank Colyer was re-elected Curator of the Odontological Collection. Sir John Bland-Sutton was re-elected President of the College. Mr. Walter G. Spencer was re-elected Vice-President, and Mr. James Sherren was elected Vice-President for the ensuing year. The diploma of Fellow was conferred upon Harry Roy Pomroy, Adelaide University and London Hospital, and the diploma of Member upon Edith Grace Peacock, Charing Cross Hospital.

Licences to practise dentistry were conferred upon 57 candidates who have passed the requisite examinations and have complied with the by-laws. The following are the names and schools of the successful candidates :—

F. M. Ackroyd, Guy's; H. S. Alexander and M. N. Anklesaria, Royal Dental; L. Barclay, Guy's; Marjorie K. M. Barnes, Univ. Coll.; W. L. Benson, H. F. Boosey, T. Brimmer, and G. L. N. Burden, Guy's; E. H. Butler, Royal Dental; S. Casper, Guy's; A. H. Chidley, Birmingham; T. O'R. Clancy and E. B. Corry, Guy's; H. A. Creeke, Royal Dental; W. Eddings, Univ. Coll.; C. H. Elphick, Royal Dental; A. C. Evans and G. Evans, Guy's; A. E. Foley and L. Foster, Royal Dental; G. E. Graham, Guy's; Annie H. Halperin, Univ. Coll.; N. Harris, Guy's; Katia Hranova, Royal Dental; O. S. Israelstam, Middlesex; W. R. Jenkins, Guy's; S. M. Jones, London; G. J. T. José and D. Kelvin-Davies, Guy's; C. H. B. Loughton, Royal Dental; Nesta G. Lewis, Univ. Coll.; G. B. Longhurst and A. S. Lowe, Guy's; E. C. Loxton and D. W. MacBean, Royal Dental; A. E. MacLagan, Guy's; J. G. Macvie, Manchester; R. H. Mallett, Durham; C. Malthouse, Manchester; B. S. Mead, Guy's; B. A. Morrisroe, Royal Dental; J. Partridge, Bristol; V. G. Pedley, London; H. R. Peek, Birmingham; J. M. Peet, Liverpool; T. G. Phillips, Royal Dental; H. H. Revill, Guy's; T. I. Richards, Birmingham; M. Simaika, H. E. Slade, E. M. Smith, and R. Thorburn, Royal Dental; D. M. Timpson and C. M. Veysey, Guy's; and H. K. Wallace and A. A. Wilkinson, London.

The undermentioned diplomas were conferred (jointly with the Royal College of Physicians of London) :—

Diploma in Psychological Medicine.—G. T. Baker, G. L. Cutts, H. T. Jones, J. J. Laws, J. B. S. Lewis, H. C. McManus, A. H. Pearce, G. F. Peters, R. G. Riches, G. R. A. de M. Rudolf, and J. Russell.

Diploma in Laryngology and Otolaryngology.—S. N. Chau, E. D. D. Dickson, R. McM. Glynn, R. E. Jowett, J. P. Kies, N. W. MacKeith, and J. H. Shaw.

THE Dickinson Travelling Research Scholarship in Medicine has been awarded by the trustees of the Manchester Royal Infirmary to Raymond Williamson, M.D. Manch., and Leslie J. Witts, M.B., Ch.B. Manch.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 24 cases were considered and £386 16s. voted to 23 applicants. The following is a summary of the new cases relieved :—

M.D. Edin., 1890, aged 71, practised in S. Africa and held several travelling appointments. Applicant asks for a grant to enable him to get massage. He is bedridden and also has chronic bronchitis. Two brothers meet the nursing home fees of 4 guineas a week, but cannot do any more for him. Voted £5. Daughter, aged 48, of L.R.C.P. Edin. who practised in Wales and died in 1924. Applicant is not mentally able to support herself, and her only income from investments amounts to £48 per annum. A brother in Canada gave £20. Rent is £31 per annum. Voted £15 in 12 monthly instalments.

Daughter, aged 58, of M.R.C.S., 1843, who practised in Warwickshire and died in 1877. Applicant lost most of her money by lending large sums to so-called friends who did not repay. She is now left with capital which brings in 15s. a week, but she has had to draw upon this capital at the rate of 32s. 6d. a week to meet expenses. She lives with an adopted sister. A cousin gave the applicant £6 last year. Rent and rates amount to £24 per annum. Voted £18 in 12 instalments and referred to our Guild for clothing.

Subscriptions may be sent to the honorary treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W. 1.

MENTAL HOSPITALS ASSOCIATION.—The seventh annual meeting of this Association was held on July 8th, when the report of the Executive Committee was received. The committee gave evidence before the Royal Commission on Lunacy Reform, and continues to take every opportunity of urging on the Government the necessity for so altering the existing system as to bring it into line with modern ideas on treatment of mental disorder. Representatives have met members of the National Asylum Workers Union to discuss hours of duty and rates of pay, and recommendations were agreed to with a view to removing certain anomalies. There have also been conferences with the Medico-Psychological Association, the Association of Clerks and Stewards of Mental Hospitals, and the National Union to discuss proposed amendments of the Asylum Officers Superannuation Act, 1909. The committee was unable to advise support of the draft Bill until more definite actuarial investigations had been made. The meeting then discussed the question of adopting a flat rate of sick-pay in all districts for prolonged periods of illness. A motion instructing the Executive Committee to take steps to secure the flat rate was carried. It was also proposed that steps be taken to secure a larger contribution from Imperial funds for local maintenance of mental cases.

ROYAL SOCIETY OF MEDICINE: ELECTION OF OFFICERS.—At the annual general meeting, held on July 1st, the following officers were elected for the session 1925-26 :—

President: Sir StClair Thomson. Past President: Sir William Hale-White. Hon. Treasurers: C. H. Fagge, M.S., and E. Farquhar Buzzard, M.D. Hon. Librarians: Walter G. Spencer, M.S., and W. Bulloch, M.D., F.R.S. Hon. Secretaries: W. Girling Ball, F.R.C.S., and H. Letheby Tidy, M.D. Other Members of Council: Sir James Berry, F.R.C.S.; Sir George Blacker, M.D.; Sir Charlton Briscoe, M.D.; Sir George Buchanan, M.D.; H. W. Carson, F.R.C.S.; Maurice A. Cassidy, M.D.; V. Zachary Cope, M.S.; T. Watts Eden, M.D.; R. C. Elmslie, M.S.; A. M. H. Gray, M.D.; Robert Hutchison, M.D.; Cyril A. R. Nitch, M.S.; Herbert J. Paterson, M.C.; Herbert Tilley, F.R.C.S.; G. de Bec Turtle, M.D.; A. E. Webb-Johnson, F.R.C.S.; and E. F. White, F.R.C.S.

The Presidents of the Sections are ex-officio Vice-Presidents of the Society and Members of the Council. The following have been elected :—

Anæsthetics: F. E. Shipway, M.D. Balneology and Climatology: R. Llewellyn Jones Llewellyn, M.B. Study of Disease in Children: Philip Turner, M.S. Clinical: G. Newton Pitt, M.D. Comparative Medicine: Frederick T. G. Hobday, F.R.C.V.S. Dermatology: J. H. Sequeira, M.D. Electro-Therapeutics: Alastair MacGregor, M.D. Epidemiology and State Medicine: J. C. McVail, M.D. History of Medicine: J. D. Rolleston, M.D. Laryngology: W. H. Kelson, M.D. Medicine: Hugh Thurstield, M.D. Neurology: H. Campbell Thomson, M.D. Obstetrics and Gynaecology: T. G. Stevens, F.R.C.S. Odontology: J. Lewin Payne. Ophthalmology: Sir Arnold Lawson, F.R.C.S. Orthopaedics: A. S. Blundell Bankart, M.Ch. Otolaryngology: G. J. Jenkins, F.R.C.S. Pathology: J. A. Murray, M.D., F.R.S. Psychiatry: R. H. Cole, M.D. Surgery: Sir Lenthal Cheate, F.R.C.S. Therapeutics and Pharmacology: George Graham, M.D. Tropical Diseases and Parasitology: Sir William Frouth, M.B. Urology: R. H. Jocelyn Swan, M.S. War: Sir William Leishman, M.B., F.R.S.

The new Council takes up office on Oct. 1st.

A GUY'S HOSPITAL "RECORD."—Last year Guy's dealt with 10,017 in-patients—the largest number ever recorded. Their average stay was $21\frac{1}{2}$ days. There were 121,000 out-patients, of whom only 179 were unable to pay for their medicines.

HOSPITAL NEEDS OF SOUTH WALES.—At a recent meeting of the Cardiff Medical Society it was stated that although the population of the Cardiff end of Glamorgan-shire numbers 800,000, only 850 hospital beds are available. On the basis of 2 beds per 1000 people, 1600 beds are needed.

THE PLYMOUTH HOSPITALS.—The exhibition opened at Plymouth by Prince Henry, reinforced by a fête and fair, on behalf of the Plymouth hospitals, has been successful beyond expectation. It was hoped to raise £10,000; more than £20,000 was actually obtained.

AN INSTITUTE OF OTOTOLOGY.—The Right Hon. T. R. Ferens, of Hull, has given £20,000 to the Medical School of Middlesex Hospital for the foundation of an Institute of Otology. It is intended to establish a laboratory, museum, and library entirely devoted to research in diseases of the ear, nose, and throat, and it is hoped that it may eventually be possible to create studentships.

A MINERS' REST HOME.—At Rudyard Lake, about 12 miles from Stoke-on-Trent, a rest home for the miners of North Staffordshire was opened on July 4th. The site for the home, the building, and its equipment cost £61,000, raised by the 1d. a ton levy for the Miners' Welfare Fund. It contains 42 beds for miners recovering from accident or illness, with billiard and other recreation rooms, and facilities are provided for outdoor amusements and exercise.

NEW SANATORIUM FOR OLDHAM.—At a cost of £10,000 the Oldham Health Committee have built a new sanatorium at Strinesdale, to replace the wooden hospital erected about 30 years ago. Situated on an eminence adjoining the Yorkshire moors, about 1050 feet above sea-level, the new building is so constructed as to get the sunlight and to protect the patients as much as possible from the wind. The building provides accommodation on two floors for 48 patients, 24 in the three end wards, and the remainder in separate cubicles. The official opening took place on June 29th.

CARTER HOSPITAL, MIDDLESBROUGH.—Nearly 20 years ago the late Alderman Carter, of Middlesbrough, bequeathed £40,000 for the provision of a hospital. This sum has accumulated to about £100,000, and the Alderman Carter Bequest Hospital is now approaching completion. By restricting the number of beds to 52 a complete endowment will be provided. Eight of the beds are for patients whose payments will just clear the cost of maintenance. The hospital, which covers four acres, is divided into three two-storey blocks and is being supplied with the most modern equipment and appliances.

SOCIETY OF M.O.H.'s: COMPLIMENTARY DINNER TO SIR JOHN ROBERTSON.—A complimentary dinner to Sir John and Lady Robertson was given by the Midland branch of the Society of Medical Officers of Health at the Queen's Hotel, Birmingham, on July 10th. The President of the branch, Dr. R. Woolsey Stocks, was in the chair. Dr. G. F. Buchan, in proposing the toast of the evening, referred to Dr. Robertson's passion for research in every branch of public health which had been the mainspring of his life, and had rendered his judgment sound on housing and the food-supply, and in the foundation of the first municipal sanatorium at Cheltenham. In cancer research his work had been silent and steadfast. His willingness to befriend all with whom he came in contact was reaffirmed by Miss Bartlett, chairman of the Birmingham Health Committee. Sir John Robertson, in reply, described the honour as a recognition of the merit of the public health service. Public health work was, he said, happy work, though results were not accomplished rapidly. Reduction of mortality in towns to nearly one-half, and infant mortality to less than half, was no doubt due to a number of causes, but medical officers of health had at all events set the pace by educational effort. The war had put back the clock 30 years for public health, but the town-planning legislation recently passed was of first-rate importance. A country breeding, and a taste for agriculture and geology he had found of great value in his work at St. Helens, Sheffield, and for 22 years at Birmingham. Mr. Furneaux Jordan proposed, and Dr. R. A. Lyster responded, to the toast of the Society of M.O.H.'s. A well-chosen musical programme added to the festivity of the evening.

THE CENSUS REPORT.—The final volume presenting tabulated statistics derived from the 1921 Census of England and Wales is now published (H.M. Stationery Office, 13s.). It contains 200 folio pages of closely printed figures, and presents for the country as a whole, and for certain subdivisions of it also, statistics of the same nature as those published in the earlier volumes for each country. It also includes certain hitherto unpublished figures dealing with populations of county court circuits and districts, seamen and fishermen not enumerated on Census night, and persons under service discipline outside Great Britain.

GUY'S HOSPITAL MEDICAL SCHOOL.—The following scholarships have been awarded: Entrance Scholarship in Arts, £100, Herbert Aidan Constable, Wimbledon College; Entrance Scholarship in Science, £100, divided between Walter Horace Allen, Guy's Hospital Medical School, and Frederick Harwood Stevenson, St. Paul's School; Confined Scholarship in Science, £100, William John Ferguson, Crampton County School and Guy's Hospital Medical School. Guy's Hospital Dental School: War Memorial Scholarship in Arts, £40 for four years, Joseph Cuthbert McNeill, Wadham College, Oxford; Entrance Scholarship in Science, £40 for four years, Geoffrey Blake Palmer, Emanuel School.

MEDICAL TOUR TO THE SPAS OF ITALY.—A second study tour for medical men to the spas and climatic health resorts of Italy, organised by the Italian State Tourist Department, will leave Milan on Sept. 5th, visiting among other places, San Pellegrino, Fonte Bracca, Acqui, Leghorn, Montecatini, Monsummano, Chianciano, Fiuggi, Allassio, and Viareggio, the tour ending at Rome on Sept. 21st. The journey is under the guidance of Prof. Guido Ruata, M.D., and medical men speaking English, French, Italian, and German will act as interpreters. The party is limited to 200 and the charge for the complete tour is 1600 lire. This includes first-class accommodation. There are still a few vacancies. Further particulars can be obtained from the Italian State Railways Tourist Office, 12, Waterloo-place, Regent-street, S.W. 1.

DONATIONS AND BEQUESTS.—Mrs. Emily Louisa Acet, Rosslyn Hill, Hampstead, bequeathed £2000 to Mabel Acet, of Ontario, lately a nursing sister of Queen Alexandra's Nursing Sisters Reserve "in recognition of her services to the Old Country in the Great War," and £2000 to the Hampstead General Hospital for the endowment of an "Acet Bed"; £200 to the Soldiers' Daughters' Home, N.W.; £100 to the Royal Sailors' Daughters' Home, N.W.; and her freehold property at Belvedere, Kent, to the Blind School, Swiss Cottage, for an "Acet" annuity.—A gift of £1000 has been made by the Mercers' Company to the Fulham, Chelsea, and Kensington General Hospital for building funds.—Mr. George Henderson, an East India merchant, of Palace Court, W., left £1000 to the London Hospital.—Mr. John Alexander Kennedy, draper, of Sunderland, left £500 each to the Sunderland Royal Infirmary, the Children's Hospital associated with the Royal Infirmary, £100 each to the Heatherdene Home, Harrogate, the Sunderland Orphan Asylum, the Northern Counties Orphan Institution for Boys, Newcastle-upon-Tyne, and £50 to the Royal Institution for the Blind, Newcastle. On the decease of his wife he left £1000 each to the Sutherland Royal Infirmary for a Jean Ross Kennedy bed and to the Children's Hospital in connexion with the Royal Infirmary for a similar bed.—The late Mrs. Harriett Sturges, of Birmingham, who left property of the value of over £30,000, bequeathed the residue after certain small bequests equally between the Birmingham General Hospital; the Queen's Hospital, Birmingham; the Birmingham Children's Hospital; the Birmingham and Midland Hospital for Women; the Birmingham Deaf and Dumb Institution; the Royal Institution for the Blind, Birmingham; and Dr. Barnardo's Homes.—The late Mr. James Taylor, M.R.C.S., of Alma-road, Clifton, Bristol, who left estate of the gross value of £22,002, among other bequests gave to Bristol University for the Medical Library all his medical books; £1000 to Epsom College for the endowment of a scholarship in memory of the Rev. W. A. Thomas, to be known as the "Thomas Scholarship"; £1000 in trust for Elizabeth Arabella Taylor for life and then to the Bristol Royal Infirmary.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	..	..	..	£2	2	0
	Six Months	..	..	..	1	1	0
	Three Months	..	..	..	0	10	6
ABROAD	One Year	..	..	..	2	10	0
	Six Months	..	..	..	1	5	0
	Three Months	..	..	..	0	12	6

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, July 21st.

GENERAL MEETING OF FELLOWS: at 5.30 P.M.
Ballot for election to the Fellowship.

BIOCHEMICAL SOCIETY.

SATURDAY, July 18th.—5 P.M., Joint Meeting with the Agricultural Education Association at University College, Reading).

Communications: R. H. A. Plimmer: The Action of Nitrous Acid upon Amides and some Amino Compounds. W. J. N. Burch: Some Esters of Phosphoric Acid. — Mattick and — Wright: The Influence of Administration of Certain Salts on the Inorganic Constituents of Milk. E. Ponder and W. W. Taylor: The Conductivity of Cell-suspensions. G. D. Thacker and J. R. Marrack: The State of Calcium in Body Fluids.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 20th.—12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Mr. Bishop Harman: Eye Dept.

TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Addison: Operations.

WEDNESDAY.—2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Mr. Tyrrell Gray: Operations.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—10.30 A.M., Dr. Dowling: Skin Dept. 11 A.M., Dr. McDougal: Electrical Dept. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations of the Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, July 23rd.—4 P.M., Dr. Nabarro: The Cerebro-Spinal Fluid in Health and Disease.

Appointments.

Royal Northern Hospital, Holloway: CALVERT, EDWIN G. B., M.D., M.R.C.P., Physician with charge of Out-patients; LANE-MOBERTS, C. S., F.R.C.S., Obstetric Surgeon with charge of Out-patients.

University of Manchester: STEWART, D., M.R.C.S., L.R.C.P., Lond., Lecturer in Anatomy; PATERSON, R. S., M.B., Ch.B. Manch., Lecturer in Applied Anatomy; OLIVER, T. H., M.D. Manch., Lecturer in Systematic Medicine; MELLAND, C. H., M.D. Lond., B.Sc. Manch., Lecturer in Medicine for Dental Students; KELLY, A. C., M.B., Ch.B. Manch., Demonstrator in Anatomy.

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. £150.
Barbados General Hospital.—Sen. Res. Surg. £330. Jun. Res. Surg. £300.

Bath, Royal Mineral Water Hospital.—Res. M.O. £130.
Birkenhead Union Infirmary.—Res. Asst. M.O. £300.
Birmingham Cripples' Union and Royal Orthopaedic and Spinal Hospital.—Jun. H.S. £150.

Birmingham, Queen's Hospital.—Asst. Obstet. O. £50.
Birmingham University.—Lecturer in Physiological Dept. £300.
Demonstrator of Anatomy. £300. Also Waller Myers Travelling Studentship. £300.

Cairo, School of Dental Surgery.—Supt. and Lecturer in Metallurgy, &c. £E.900. Lecturer in Surg. £E.480. Asst. Lecturer in Surgery. £E.360. Lecturer in Mechanics. £E.480.

Cardiff City Mental Hospital, Whitchurch.—Res. Clin. Asst. 50 guineas.

Cumberland and Westmorland Mental Hospital, Jun. Asst. M.O. £350.
Deptford Metropolitan Borough.—Asst. M.O.H. and Tuberc. O. £750.

Durham County Mental Hospital.—Asst. M.O. £40⁰.

Eastbourne, Royal Eye Hospital.—Hon. Ophth. S.

East London, South Africa Frere Hospital.—Res. M.O. £300.

Evelina Hospital for Children, Southwark, S.E.—H.S. £120.

Gloucestershire Royal Infirmary, &c., Gloucester.—Asst. H.S. £150.

Grosvenor Hospital for Women, Vincent-square.—Anæsth.

Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—Radiologist. £100.

Hertford County Hospital.—H.S. £150.

Hong Kong University.—Reader in Biology. £600.

Liverpool University.—Professor of Entomology. £800.

Manchester, Ancoats Hospital.—Asst. H.P. £100. Also Anæsth. 10s. 6d. per attendance.

Margate, Royal Sea Bathing Hospital.—H.S. £200.

Northampton General Hospital.—Hon. Asst. S.

Pietermaritzburg, Grey's Hospital.—Male H.S. £500.

Queen's Hospital for Children.—Asst. Cas. M.O. £100.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—Hon. S. Also Hon. Asst. S.

St. Mary's Hospital for Women and Children, Plaistow.—Clin. Asst.

St. Marylebone General Dispensary.—Gynaecologist.

St. Paul's Hospital for Skin, &c., Diseases.—Hon. Anæsth.

Sanaritan Free Hospital for Women.—H.S. £100.

Southampton, Royal South Hants Hospital.—Jun. H.S. £150.

Whittingham, Preston, County Mental Hospital.—Temp. M.O. £7 per week.

Willesden General Hospital.—Hon. Anæsth.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments for Certifying Factory Surgeons: Snaith, Yorks; and Hoddesdon, Hertford.

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Camelford, Holsworthy, and Launceston, &c., County Courts. Applications should reach the Private Secretary, Home Office, not later than August 5th.

Births, Marriages, and Deaths.

BIRTHS.

BATTERHAM.—On July 5th, at the Military Families Hospital, Cologne, the wife of Captain D. J. Batterham, R.A.M.C., of a son.

CLOUSTON.—On July 6th, at Lavenham, Suffolk, Olive Gwendolen Clouston, M.R.C.S., L.R.C.P., wife of Eric C. T. Clouston, M.R.C.S., L.R.C.P., of a son.

KERRIGAN.—On July 2nd, at Devonport, the wife of Surgeon-Lieut.-Commander O. J. M. Kerrigan, R.N., H.M. Dockyard, of a son and daughter.

RIVETT.—On July 12th, at a nursing home, to Mary, wife of Louis Carnac Rivett, of 118, Harley-street and 3, Hanover-terrace—a daughter.

SOUPER.—On July 11th, at Victoria-street, Aberdeen, the wife of Dr. H. Ross Souper, of a daughter.

MARRIAGES.

CLAXTON—ERVINE.—On June 30th, at Saint Saviour's Church, Denmark Hill, Dr. E. Claxton, of Bath, to Muriel Ervine, of Denmark Hill.

COLWILL—WORRINGHAM.—On July 11th, at St. Mary Abbot's, Kensington, W., Charles Kingsley Colwill, M.R.C.S., L.R.C.P., to Muriel, daughter of Mr. and Mrs. Charles Worringham, of Inverna-gardens, Kensington, W.

DEATHS.

CAMPBELL.—On July 3rd, at a nursing home, after an operation, George Maclean Campbell, M.C., M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond., late Captain, R.A.M.C., aged 37.

CLEFORD.—On July 8th, at his residence, 15, St. John-street, Manchester, Harold Clifford, M.B., F.R.C.S. Edin., Hon. Gynaecological Surgeon to St. Mary's Hospitals, Manchester, and the Salford Royal Hospital.

GUBBINS.—On July 8th, at Westgate, from the effects of a cycling accident, Lieut.-General Sir Launcelette Gubbins, K.C.B., M.V.O., J.P., late Director-General A.M.S., in his 76th year.

REW.—On July 6th, died suddenly, G. R. Rew, M.R.C.S., L.R.C.P., of Bedford, Feltham, late of King's College, London.

STEWART.—On June 26th, at Stonebridge Park, William James Johnstone Stewart, M.D. Edin., D.P.H. Camb., for 22 years Medical Superintendent of the Willesden Municipal Hospital, aged 57.

WICKHAM.—On June 30th, at Lenworth, Southbourne-on-Sea, Hants, Charles A. Wickham, M.R.C.S., L.R.C.P., late of Willesborough, Ashford, Kent.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

COLONIAL HEALTH REPORTS.

CAYMAN ISLANDS (DEPENDENCY OF JAMAICA).

Mr. H. H. Hutchings (Commissioner) has forwarded to the Colonial Office a report for 1923 on these three small islands in the Caribbean Sea, lying north-west of Jamaica, and approximately mid-way between that island and the south-west coast of Cuba. He states that the general health of the Dependency is good. Digestive disorders of a mild nature are prevalent, induced by the sameness of a diet of starchy foods. There is an occasional case of typhoid. Care with respect to arrivals from Jamaica have prevented the introduction of alastrim. There were 179 births in 1923 (34 per 1000) and 55 deaths (10 per 1000). The population is estimated at approximately 5253. The rainfall amounted to 54.76 inches in the Georgetown or western district of the Grand Cayman. The air temperature ranges between 70° and 80° F. in the cooler winter months, and 10° higher in summer. The nightly calms and the excessive dampness accentuate the heat of summer.

LEEWARD ISLANDS.

In the report for 1923-24 the following particulars are given respecting the five Presidencies constituting the Federation or Colony. In Antigua the estimated population on Dec. 31st, 1923, was 29,420. The births during the year were equal to a birth-rate of 38.68 per 1000, of which 78.03 were illegitimate. The death-rate was 27.56 per 1000. In the Presidency of St. Kitts-Nevis, the birth-rate was 41.7 per 1000 in St. Kitts, 30.8 in Nevis, and 28.6 in Anguilla. In Dominica the population was estimated at 38,632, the birth-rate 37.22 per 1000, and the death-rate 26.66. Illegitimate births exceeded the legitimate by 292. Montserrat had a population of 11,890. The legitimate births were 110 and the illegitimate 315, the percentages being 25.8 and 74.1 respectively. The death-rate was 15.5 per 1000. The general health of the colony during the year was satisfactory. No epidemic disease occurred. The appearance of small-pox in Antigua led to the introduction, for a period of five months, of compulsory revaccination in St. Kitts-Nevis. The campaign met with ready acceptance on the part of the public. The revaccinations performed, added to the number of those persons immunised by recent revaccination or primary vaccination, may be regarded as having effected for the present the satisfactory protection of the whole Presidency. The vigilance and precautions of the whole Quarantine Board and Harbour Authorities, however, have been in no way relaxed. The campaign against yaws and syphilis, which had been in abeyance for a time, was recommenced on improved lines in November, 1923. The moogrol treatment of the inmates of the Leper Asylum was continued and extended during the year with gratifying results. The epidemic of alastrim, which had been present in the island since July, 1922, and which had done considerable harm to trade owing to the quarantine restrictions imposed by other places, came to an end in September, 1923. No further cases have occurred.

MAURITIUS.

The report for 1923 is signed by Mr. H. Lalouette, Acting Assistant Colonial Secretary. The section relating to vital statistics and public health states that the estimated population on Dec. 31st was 381,678, an increase of 5193 on the last census figures. The birth-rate in the general population was 40.9 and in the Indian population 34.9 per mille, whilst the death-rates per 1000 in the two populations were 29.6 and 28.1. The mortality was remarkably low, the death-rate being the lowest since 1891. The number of deaths due to malaria and malaria cachexia (the highest death-producing factors in Mauritius) was 1979, as against 3526 the year before. The next high causes of death were pneumonia and broncho-pneumonia (1393) and diseases of early infancy (1026). There were 139 cases of plague during the year, of which 118 were fatal; the largest number of cases was, as usual, in Port Louis (117). There were 150 cases of enteric fever, as against 224 in the previous year. The infantile mortality (deaths of children under one year) gave a ratio of 139.4 per 1000 live births, as against 147.9 in 1922. There were 1557 still-births registered during the year, corresponding to a rate of 112.2 per 1000 live births. The number of cases treated in the public hospitals and at the dispensaries was 82,326, this total being much below that for 1922 and for the five-year period 1919-23. The total number of persons certified insane on Dec. 31st was 708, or 34 less than

the year before. Admissions to the lunatic asylum numbered 194. At the Leper Asylum there were 37 patients (males 25, females 12) at the beginning of the year. Admissions during the year numbered 16, deaths 2, and discharges 14. The construction of the new leper asylum has been completed, and the transfer of the lepers effected. The law relative to compulsory segregation of lepers will be brought into operation at an early date. The climate is tropical, but, owing to the high elevation of the central plateau, a large part of the island enjoys a temperate and even bracing climate. The average temperature of this highland region is about 60° F., and the maximum about 80°. The low-lying coastal region has naturally a higher average temperature ranging from 90° to 70°. Mauritius lies in the track of cyclones, which are liable to occur during the months of December to April. There has been no very severe cyclone since 1892. The rainfall is irregular, and varies according to the locality and elevation. In the central portion of the island an average yearly rainfall of 175 inches is recorded. That of the coastal districts varies between 25 and 30 inches.

SEYCHELLES.

Brigadier-General Sir Joseph A. Byrne, K.B.E., C.B., the Governor of this colony, in his report for 1923, states that the population is estimated at 25,700, being an increase of 1177 since the Census of 1921. The births in 1923 numbered 771, corresponding to a rate of 30.62 per 1000. The deaths were 297, or 11.79 per 1000. This low death-rate constitutes a record, and is partly due to the fact that no epidemics of an infectious or contagious disease occurred during the year. Although almost on the equator, the climate of Seychelles is quite healthy, and owing to the absence of the anopheline mosquito malaria does not occur. The maximum shade temperature rarely exceeds 86° F., but even at night the temperature seldom falls below 74°. The hottest weather occurs during the months of March and April. The rainfall averages about 90 inches, although in some years it has reached 115 inches. The estimated total number of square miles comprised in the Seychelles Islands and their dependencies is 156½.

TONGAN ISLANDS PROTECTORATE.

Mr. J. McOwan, the British Agent and Consul at Tonga, writes in a report for 1923-24 that the estimated population on Dec. 31st was 24,673. The birth-rate for the year was 33.21 per 1000, and the death-rate 22.68. The population includes 571 Europeans and 235 half-castes. The islands are situated 390 miles to the E.S.E. of Fiji, and have an area of 385 square miles. Queen Salote Tubou, the present queen, succeeded to the throne on the death of her father, King George Tubou II., in 1918. A Protectorate was proclaimed over the kingdom of Tonga in 1900, under which Great Britain assumed the exercise of civil and criminal jurisdiction over all subjects and foreign powers in Tonga, and an agent and consul was appointed to advise the Queen and Government, and to supervise the financial administration. The seat of government is at Nukualofa, on the island of Tongatapu. Although the Tongan group lies between latitudes 16 and 22 degrees south, and is therefore within the tropics, the climate is probably the best of any of the islands in the Western Pacific. For eight months of the year (May to November inclusive) the thermometer rarely registers higher than 83° F., and as the humidity is comparatively low during these months, Europeans do not feel the heat to the same extent as in the groups to the north. During the wet season (December to March inclusive) the temperature ranges from 65° to 94°, with a higher humidity. Malaria and tropical fevers are unknown.

THE WHISPER AS A MEASURE OF DEAFNESS.

A WHISPER, uttered at the end of expiration, is more likely than the normal voice to have a similar loudness from day to day, and that is why a whisper is used for the assessment of deafness in the French Army, no recruit who cannot hear a whisper at 18 inches being accepted for the ranks, though he may be accepted for the auxiliary services if he can hear it at anything over 9 inches. Méd. Maj. P. E. H. F. Bertin, from whose paper on "The Measurement of Deafness," in the *Archives de Médecine Militaires* for April we quote, adds that the figures 1, 3, 9 are more easily heard by men with nerve deafness; 5, 6, 8 by those with middle-ear disease. Before men are sent to the ear specialist, with whom in every doubtful case lies the ultimate decision, each should have his deafness estimated quantitatively, and more than once, by his regimental officer, to allow the honesty of the patient to be appreciated, and also possible variations in his deafness.

An Address

ON THE

EVOLUTION OF A HEALTH RESORT.

Being the Presidential Address delivered at the Annual Meeting of the British Medical Association in Bath on July 21st, 1925.

BY F. G. THOMSON, M.A. CAMB., M.D.,
M.R.C.P. LOND.,

PHYSICIAN, ROYAL UNITED HOSPITAL, BATH; CONSULTING
PHYSICIAN, MINERAL WATER HOSPITAL, BATH.

THE history of a town that has been closely associated with the treatment of disease for nearly 2000 years, and probably longer, naturally possesses many features of medical interest, and it may not be out of place to-night, at the commencement of this meeting, to refer to certain phases of the evolution of Bath as a health resort, and to certain of the characters, medical and otherwise, who have played their part in its medical history.

EARLY DAYS.

Though the hot springs have been used in the treatment of disease ever since the Roman occupation, it was not till the middle of the sixteenth century that their therapeutic properties engaged the serious attention of the medical profession, and our knowledge of the actual practice of medicine in Bath remains very fragmentary till about the time of Queen Elizabeth, when its reputation as a resort for visiting patients first became established.

The primitive conditions, however, which obtained in the time of the late Tudors and early Stuarts were such that one imagines nothing but dire necessity would have caused anyone to visit Bath at that time. The town itself was one of the meanest in England, and the streets are said to have been a succession of dunghills, pigsties, and slaughter-houses. The baths themselves consisted of dilapidated, ill-kept, dirty pools, open to the air, and surrounded only by a low parapet, over which the more idle and inquisitive of the inhabitants were accustomed to view the proceedings at their ease and leisure. Men and women bathed together, naked, at nearly all times of the day and night, and disorder of all kinds was rampant. The baths are said to have resembled a veritable bear-garden, and cats, dogs, and even human bodies to have been hurled into the bath while people were bathing in it.

In spite of all the discomforts and positive dangers, Queen Anne of Denmark, the wife of James I., decided to take a course of baths in the bath known as the King's Bath. Unfortunately, Her Majesty had a somewhat alarming experience, as a ball of fire is said to have risen from her feet and spread out all over the surface of the bath. This remarkable phenomenon, which one can only suppose was an ebullition of marsh-gas rising from the mud, which was disturbed by the lady's feet, so alarmed the Queen that she refused to bathe there any more, and was with difficulty persuaded to finish her course of treatment in an adjoining bath, since known as the Queen's Bath, where she was assured such cataclysmic disturbances were never known to occur.

THE STUART COURT.

The reign of Charles II., however, marked the commencement of an entirely new phase in the history of the town. Whereas people had hitherto come solely for reasons of health, they now began to come for pleasure. In 1663 Charles II. formally removed his Court to Bath, and the concourse of people was so great that not only the town, but the surrounding villages also, were crowded with visitors. Though certain improvements had been effected in the conduct of the baths, and though quite a number of Bath physicians had by this time written more or

less learned books on the action of the waters, the scene depicted in the print of the King's Bath in 1667 hardly suggests that balneological treatment was as yet regarded by the public with that respect which it deserved.

The proceedings appear to have been looked upon more as a popular entertainment than as a remedy for disease, and the antics of children diving for pennies, and of their elders indulging in fancy forms of swimming, appear to have afforded more amusement to the onlookers than to the unfortunate patients. The number of the latter, however, was steadily increasing, and included more particularly cases of rheumatism, gout, diseases of the skin, diabetes, dropsy, and paralysis. The reputation the waters had acquired for the treatment of sterility induced the Queen, Catherine of Braganza, to take a course of baths in the hope of providing an heir to the throne, and thereby regaining the waning affections of the errant and profligate Charles.

Besides the King and Queen, the Duke of York, and Prince Rupert, we learn that King Charles's somewhat Oriental *ménage* included Lady Castlemaine, the Duchess of Cleveland, and the Duchess of Portland, two others of Charles's acknowledged mistresses, and last but not least, the beautiful Miss Stewart. This pleasant little coterie, together with the rest of the Court, lodged, and apparently lived a somewhat hectic life, at a house known as Abbey House, adjoining the King's Bath.

DR. PIERCE AND DR. GUIDOTT.

Abbey House, known also as the Royal Lodgings, was owned by a Dr. Robert Pierce, the most successful practitioner in Bath of his day, and used by him as a sort of clinic to accommodate many of his more important patients.

Dr. Pierce, whose list of "Cures wrought by God's Blessing on the Directions of Robert Pierce, M.D.," shows him to have been a practical, painstaking, and careful physician, was evidently a firm believer in the proper selection of suitable cases for treatment at Bath. This is shown by his account of a certain Mrs. Frisby, sent to him from Northamptonshire, suffering from palsy and loss of speech, of whom he says:—

"On bathing she apparently grew worse, especially in her speech, which very much discouraged her in proceeding farther. And indeed I was not very importunate with her for her longer stay, lest the Great Bell should have rung out for her here; for then inquiry would have been made, Whose Patient she was? Not what Distemper she had? or whether a due method had been used for her recovery; but with the Vulgar (who measure all things by the Success) the Physician that does not cure shall be sure to have the Reputation of killing the Patient that dies, be the disease or the patient never so much incurable. I return'd her back, therefore, to him that sent her hither, with advice to use Antiscorbuticks and Cephalicks, and never since heard anything of her."

The subject of after-treatment also received his most serious attention; one of his favourite prescriptions being a "sacculus," or in other words a muslin bag, containing various herbs, to be suspended in a barrel of beer.

Dr. Pierce's great rival was a Dr. Thomas Guidott, a distinguished graduate of Oxford, whose scientific bent induced him to carry out elaborate and painstaking researches on the chemical composition of the waters. Among his other activities he found time to write biographical accounts of all the doctors in Bath between the year 1600 and 1680. His biographies of some of the better known doctors of his time, such as Dr. Jorden, Dr. Bave, and Dr. Venner, show them to have been men of the highest integrity and professional attainments.

A GENERAL CASINO.

Though Queen Catherine of Braganza's hopes were not realised, her successor, Queen Mary of Modena, wife of James II., who bathed in the Cross Bath for a similar reason, was more fortunate, a son being born to her in the ensuing year. This was regarded

as a most remarkable and convincing proof of the efficacy of the waters, and was suitably commemorated by placing an ornamental cross in the centre of the bath, with an appropriate inscription recording the circumstances.

Long before these events took place, however, the city had reached the acme of its fame, not only as the resort of the sick and ailing, but as the periodical visiting place of all who aspired to take any position whatever in the world of fashion. During the reign of Queen Anne, Bath became a sort of general casino for the whole kingdom. The Queen herself, who is said to have been such a martyr to gout that she was unable to stand during her coronation service, paid several visits, and for the next 120 years or more there is hardly a single person of distinction, from Royalty downwards, whose name is not in some way or another connected with visits to Bath, either for health or pleasure.

Thanks to the numerous authors and dramatists, such as Steele, Defoe, Goldsmith, Sheridan, Anstey, and others, who habitually visited Bath in the eighteenth century, the social habits and customs of this picturesque period are peculiarly well known to us. Whatever their other predilections may have been, we learn that the first and chief preoccupation of the majority of the company was the daily visit to the bath.

BATHS FOR DIVERSION.

In addition to those who took their baths under medical orders, many others bathed for diversion. The bath became a sort of fashionable parade which few cared to miss. The simple bathing dresses in vogue at the end of the seventeenth century were gradually replaced by more elaborate costumes, till eventually both men and women took to the water arrayed in the height of fashion. Ladies of distinction bathed in state, and were attended by the daughters of prominent citizens. Those who desired them were supplied with small floating trays, on which they placed nosegays, sweetmeats, snuff, and such trifles as face-powder and patches, to replace those dislodged by the moisture. The rule that the gentlemen should remain at one side of the bath and the ladies at the other seems to have been honoured more in the breach than in the observance. The patients were conveyed to and from the bath in sedan chairs, which in the case of the ladies were, to use the words of a contemporary French writer, "hermetically sealed when the occupants were old, ugly, or prudish, but artistically penetrable when they were finely formed."

Water-drinking, which by this time had become an established part of the treatment, took place later in the morning at the old Pump Room, which was replaced at the end of the century by the present structure. It was here that, to the accompaniment of a prodigious amount of gossip, scandal, and general disturbance, the prototypes of Lady Teazle, Lady Candour, and Mrs. Malaprop were to be found daily, drinking their quantum of water, and at the same time unsuspectingly providing Sheridan with the material for his plays.

The general régime and amusements of the patients, which after all constitute an important factor in their "cure," need only very brief reference. Fortunately we are able to get some idea of them, even if it is somewhat distorted, from the caricatures of Rowlandson and other cartoonists of the period. Following the parade in the Pump Room, public breakfasts formed an important feature. Later on in the day, after promenading in the parades, or adjourning to the various coffee-houses to hear the latest news, gambling, which in the time of the Georges was an almost universal passion, occupied the attention of the majority. Music, the drama, and art occupied the attention of the more intellectual of the company. Concerts were held daily, and it was while singing at one of those that the beautiful Miss Linley engaged the affection of the youthful and impetuous Sheridan.

CRITICS, FRIENDLY AND OTHERWISE.

The presence of such a large number of invalids from all parts of the country naturally attracted a great many doctors, many of whom practised in Bath during the season, and in London or elsewhere during the rest of the year. Amongst these there were probably a good many whose professional reputation and standard of ethics left something to be desired, and it is not surprising that in an age when wit, satire, and caricature were the predominant features in the literary world, they came in for their full share of ridicule and criticism. Thus Steele, writing in the *Guardian*, relates what he alleges to have been his own experience of the methods adopted for soliciting practice, saying:—

"The physicians here are very numerous, but very good-natured. To these charitable gentlemen I owe that I was cured in a week's time of more distemper than I ever had in my life; they had almost killed me with their humanity. A learned fellow lodger presented me a little something on my first coming, to keep up my spirits; and the next morning I was so much enlivened by another, as to have an order to bleed me for my fever. I was proffered a cure for the scurvy by a third, and had a recipe for the dropsy gratis before night. In vain did I modestly decline these favours, for I was awakened early in the morning by an apothecary, who brought me a dose from one of my well-wishers. I paid him, but withal told him severely that I never took physic. My landlord hereupon took me for an Italian merchant that suspected poison; but the apothecary, with more sagacity, guessed that I was certainly a physician myself."

The most bitter criticism of the local doctors comes from Smollett, the author of "*Peregrine Pickle*" and "*Roderick Random*," both of which deal largely with the social life of Bath. Smollett himself was a doctor of medicine, and at one time essayed to practise in the town, and actually wrote a book on the external use of Bath waters. His lack of success appears to have roused feelings of intense bitterness against his more fortunate rivals, whom he describes as "a class of animals who live in the place, like so many ravens hovering round a carcass, and even ply for employment like scullers at Hungerford Stairs." In the circumstances, however, Smollett's virulent attacks on his own profession need hardly be taken too seriously, more especially as he shows a sordid tendency to paint all his characters in the most unfavourable light.

A more humorous parody on the ways of some at least of the Bath physicians of the eighteenth century is contained in Anstey's "*New Bath Guide*," which, in a series of letters, relates the adventures of a somewhat unsophisticated family during a visit to Bath for the sake of their health. In a letter to his mother, written on his arrival, Mr. Simpkin Blunderhead writes of his doctor:—

"He determined our cases at length (God preserve us);
I'm bilious, I find, and the women are nervous;
Their systems relax'd, and all turned topsy turvy,
With hypochondriacs, obstructions, and scurvy;
And these are distempers he must know the whole on,
For he talked of the peritoneum and colon."

According to Anstey, none of the doctors indulged in the baths they so freely prescribed for the patients, thus:—

"Though many a skilful and learned physician,
With candour, good sense, and profound erudition,
Obliges the world with the fruits of his brain,
Their nature and hidden effects to explain,
Not one of the faculty ever has try'd
These excellent waters to cure his own hide."

Though the criticisms of Steele, Smollett, and Anstey were probably thoroughly well deserved by those to whom they were directed, it must not be supposed that all the physicians in Bath were tarred with the same brush. On the contrary, many of them were men of the highest standing and repute, hardly to be distinguished, as Barbeau says, from the best of their colleagues in London. Among them may be specially mentioned Dr. Hartley, ranked by Coleridge with Milton, Newton, and Priestley; Dr. Cheyne,

of whom Pope said there was no honester man or truer philosopher: Dr. William Oliver, a founder, and the first physician to the Mineral Water Hospital; Henry Harrington, renowned for his literary ability as well as for his knowledge of medicine; William Falconer, the physician to Pitt, who shares with Priestley the distinction of being the discoverer of oxygen. Last, but not least, of the eighteenth century physicians, we have Caleb Hillier Parry, who practised in Bath from 1780 to 1816, and whose contributions to medical literature, no less than his skill in practice, entitle him to rank as one of the most eminent physicians of his day.

LATER DEVELOPMENTS.

Though time will not allow of any references to the many distinguished Bath patients in the eighteenth century, one may specially mention John Hunter, who paid visits in 1777 and 1778 for the relief of pain associated with the aortic aneurysm which eventually caused his death. His condition being much worse in 1785, he hastened back to Bath, but became progressively worse, and died in London some months later. Though the vogue of Bath remained undiminished during the earlier years of the nineteenth century, important changes were gradually taking place in its fortunes, both from a social and medical point of view. Increasing facilities for travel

and the wider diffusion of wealth began to lead people further afield, and Bath gradually lost its unique position as the chief, and in fact the only, resort of fashion in this country. On the medical side changes no less striking were also in progress. Balneological treatment began to be carried out on much more serious and rational lines. The promiscuous treatment of all types of patient in a common bathing pool, open to the gaze of an idle and inquisitive public, ceased with the erection, in 1798, of private suites of baths, which were the forerunners of the present installation, and in which various forms of treatment could be given to suit individual cases. The study of hydrology was being actively taken up, both in this country and on the continent of Europe.

The work of Dr. Currie of Liverpool, and later of Priessnitz in Silesia, called attention, in the first place, to the possibilities of effective treatment by the hot and cold application of ordinary water. Side by side with this development of hydrotherapy the study of the specific therapeutic properties of the various natural waters steadily advanced, till eventually that branch of therapeutics now known as medical hydrology may be said to have gradually emerged from a form of empiricism, based largely on tradition and superstitious belief, to a recognised branch of scientific medicine.

Fifty Years

OF

PROGRESS IN PUBLIC HEALTH.

Being the Presidential Address delivered to the Sanitary Science Section of the Congress of the Royal Sanitary Institute at Edinburgh on July 21st, 1925.

By SIR GEORGE NEWMAN, K.C.B., M.D. EDIN.,
F.R.C.P. LOND.

[Sir George Newman introduced an eloquent address on the progress of public health during the past half century by detailing the various factors which culminated in the Public Health Act of 1875, considering these also in the light of future developments. He showed how enfranchisement of the town labourer in 1867, reform in the civil and military services, and the Education Acts were followed by further extensions of the franchise, which culminated in 1918, when the number of Parliamentary voters, now of both sexes, was trebled. He indicated the aspirations produced, as well as the disappointments which accompanied the liberal reforms, and referred particularly to the disease and despair which came in the train of the great industrial revolution. He showed how Chadwick's monumental "Survey" led to the Royal Commission on the Health of Towns and the Public Health Act of 1848, and how the influence of Bentham's utilitarian philosophy, of Owen, Cobbett and the Chartists, combined with the effects of the splendid reports of Simon to the Privy Council, and the work of Arnott, Kay, Southwood Smith and Greenhow to prepare the public for the developments to follow the Public Health Act of 1875.

Sir George Newman then sketched vividly the new influences after 1875, showing how two years after the passing of the Act the discovery of bacterial causes of disease revolutionised medical views and practice so that the centre of gravity turned from environment to infection "not only to the agents of infection but to the conditions of persons and environment, the lack of resistance which favoured those agents." There was a rapidly growing knowledge and sense of physiology which has continued to exert, during the last fifty years, an effect on the whole

outlook of Preventive Medicine, while social emancipation has accompanied a rising standard of education and material comfort. It is now known that the chief defence against disease is not changed environment but the body of man, and secondly that obedience to the laws of physiology is necessary both for the maintenance of the body in health and for its full capacity and effective use.

The first section of the address closed with the statement that utilitarianism, environment, infection, physiology, and social emancipation have exerted an active influence in the past and are likely to achieve even more in the immediate future. Sir George Newman continued:—]

THE RESULTS OF THESE REFORMS.

Looking back from 1925, we may well ask, What has been the result? Well, first there has been a decline in the death-rate. In 1871-80 it was 21, and in 1924 it was 12; in the same period the infant mortality-rate, a most sensitive index of national health, was brought down from 149 per thousand born to 75. Expressed in another way, the expectation of life for every child born in Britain to-day is approximately 12 years longer than that of its grandfather.

The life-table published by Sir William Hamer in 1923 gives the actual figures for London:—

*London Life Table, 1841-1922.**

Period.	Expectation of life (years).		Period.	Expectation of life (years).	
	Males.	Females.		Males.	Females.
1841-50 ..	34.6	38.3	1891-1900 ..	41.2	45.4
1851-60 ..	36.4	40.4	1901-10 ..	47.2	51.9
1861-70 ..	35.7	39.9	1911-12† ..	49.5	54.5
1871-80 ..	38.0	42.4	1920-22 ..	53.8	59.1
1881-90 ..	40.1	44.5			

* Annual Report of London County Council, 1923, Ch. xxiii. and xxiv., Report of the County Medical Officer of Health, p. 13.
† The last pre-war years for which comparable figures are available.

Mr. W. Jones, the secretary of the Public Health Department of Glasgow, has recently shown that in 1870-72 the male infant born in that city had an "expectation" of 31 years, which in 1920-22 had been raised to 48 years, and the female infant had risen from 33 to 52 in the same period. It is significant that the "expectation" of life was better in Glasgow in 1821-27 than in 1870-72.

Then, in the second place, there has been a reduction in sickness and invalidity from certain diseases. In 1875 *enteric fever* accounted for 370 deaths in each million, last year the 370 had fallen to 12. Its incidence in the South African war was 28.5 per cent. of troops, in the European war 1 per cent. In 1875 there were 1500 deaths attributed to *typhus* in England and Wales (which had been differentiated from enteric in 1850); in 1924 there were only 5. But 100 years ago, in London and Edinburgh, typhus was endemic, with periodic epidemic outbursts. "The disappearance of typhus and relapsing fevers from the observation of all but a few medical practitioners in England, Scotland and Ireland," says Creighton, "is one of the most certain and most striking facts in our epidemiology," and he attributes their disappearance to better housing, cheap food, and increased wages. The *tuberculosis* death-rate is declining rapidly and with increasing velocity. In 1847 the death-rate per million from consumption was 3189, in 1875 it was 2313; and in 1924 it had fallen to 801. It is hardly too much to say that if this decline should continue more or less along the line it has followed, tuberculosis will have become a rare disease before the end of the present century.

Small-pox was a national scourge a century ago; to-day it is the perquisite of those who elect to have it. Last year Sir Clifford Allbutt declared that the almost complete abolition of *chlorotic anemia* of young women is one of the most remarkable issues of a single generation of modern preventive medicine. All this has meant an immense saving of human life, an increase of human capacity and national wealth, an incalculable extension and enlargement of happiness and contentment.

But there is another epoch-making effect. The preventive medicine of 50 years has, in the words of Rudyard Kipling,

"Smote for us a pathway
To the ends of all the earth."

In some ways the most wonderful medical triumph of the past half century has been the discovery of the means of the *control of the tropics*. It is true that we are yet a long way off complete control, but the causes of disease have been found and the means of stamping them out demonstrated. *Famine* stands in the front line of the captains of the men of death—and the advance in methods of irrigation and transport of food have greatly reduced it and played a prominent part in the establishment of public health. Close behind famine follows disease. The discovery of the causes of malaria, of yellow fever, of plague, of cholera, and of sleeping sickness is common knowledge. Yet all these discoveries belong to the period since the Public Health Act of 1875.

Malcolm Watson demonstrated the possibility of preventing *malaria* in the Federated Malay States by banishing the anopheles' breeding places by the clearance of the coastal forest and subsoil and surface drainage. In India and elsewhere this technique may prove inexpedient or insufficient, unless supplemented by a direct attack on the mosquito in its larval or adult stage, or screening habitations or persons from its invasion, or treating cases or carriers. Indeed, the recent Malaria Commission of the League of Nations in Italy, Russia, and Eastern Europe has recommended for countries with incomplete public health services and limited funds the urgent necessity of abstaining from "radical" engineering measures and adopting "primary" public health measures of ascertainment of infection, treatment and after-treatment of patients and carriers, and dealing directly with infected houses and mosquitoes—in a word, quinine, the attack on the mosquito, the protection of the individual, and general sanitation.

The work of Gorgas in stamping out *yellow fever* in Havannah and on the Panama Isthmus is well

known. By a strict discipline of quarantine, hospital isolation, drainage, sanitation, and mosquito screening and destruction, he was able to eliminate this disease, even though an immigration of non-immune population was continually occurring.

Practical measures against *sleeping sickness* (trypanosomiasis) have been taken effectually in the Cameroons, the Congo, Tanganyika, Kenya, and Uganda. They consist of the systematic surveys (clinical and bacteriological) of the infected population, followed by curative and prophylactic use of atoxyl in large doses; the separation of the healthy from the infected, with the isolation, if necessary, of whole villages or the migration of sections of the population from areas or streams affected with the tsetse-fly; sanitation of villages and improvement of diet; the clearance of banks of water-courses, paths, roads and settlements of all brushwood, and their proper drainage; and lastly, fly destruction by means of bird-lime or otherwise. These methods have completely suppressed sleeping sickness in the Portuguese Island of Principe, off the west coast of Africa, and proved effective in terminating recent disastrous epidemics on Lake Victoria Nyanza, and elsewhere in equatorial Africa. In this way hundreds of thousands of lives have been saved, and the way in which the tropics can be brought under control has been demonstrated. This problem of tsetse-fly is, in the opinion of the East African Commission (1925), "probably the most serious threat to the population in our East African territories. . . . We regard the tsetse domination as constituting a menace not merely to East Africa, but to all those countries which look to East Africa as the source of supply of food and raw materials."

All this can mean only one thing. The last half century has proved beyond doubt that nationally and imperially preventive medicine has now become practical politics. The trail has been blazed. It remains for this country to use it, apply it, and extend it—and all of it—with courage and wisdom, to its national and imperial problems as the sound and economic policy. A stunt here and a stunt there will not suffice—it should be organised as a whole, as an integral factor in state-craft.

THE FUTURE.

Let us turn to the future. Much remains to be done. For whilst progress has overcome many diseases, others remain prevalent and destructive. In 1924, in England and Wales, respiratory diseases caused 82,000 deaths, diseases of the heart and circulation 79,000, cancer 50,000, nervous diseases 47,000, tuberculosis 41,000, and influenza 19,000. These are very formidable enemies, responsible for 65 per cent. of our mortality, and we cannot yet defeat them. We still lose nearly 3000 mothers in childbirth, and more than 50,000 infants before they have completed their first year, and in both categories the maimed far outnumber the dead. We still have 40 per cent. of the deaths occurring under 50 years of age. In 1924 the sickness among insured persons only entailed more than 23 million weeks of lost work, equivalent to 447,000 years, or to 447,000 persons off work for a year. It is a very serious, and largely a preventable, drain upon national resources, costly and wasteful in many ways. In a word, national ill-health loses time and reduces production, as well as resulting in suffering, discontent, and premature death.

The history of the evolution of our system of public health since 1875, and its effects reveals, as we have seen, some of the chief influences which have played a predominant part. We must continue to be utilitarian in the best sense of the term. We must also be more economical. Our financial resources must be husbanded and our revenue not mis-spent or frittered away. I am convinced that the ratepayer is reasonable when he asks for equally good results at less total cost. In fact, it is now a national necessity that money must be saved and

not wasted; production must be increased and not diminished; personal responsibility stimulated and not weakened.

But the past teaches us we must still build upon a sanitary foundation; we must, like Harvey, "search and study out the secrets of Nature by way of experiment," and by research learn more of the hidden paths of infective processes; we must teach and practise physiology; and above all, we must understand the social habits, aspirations, and psychology of the people. Yet for public practitioners of the science and art of preventive medicine all this is not enough; it is not close enough down to the business we have in hand. These high things must be harnessed in the statesmanship and technique of health administration, and there seem to me to be three main lines along which there is urgent need to advance.

1. A NEW LOCAL UNIT OF SANITARY GOVERNMENT.

The present system of local health government in England is like an Egyptian palimpsest, composed of several layers of design lying one upon the other. At the bottom there are the Poor-law unions, next above them and three times more numerous are the local sanitary authorities, superimposed upon which come the local education authorities (318), then the insurance committees numbering 145. Thus the whole country is mapped out four times over, but the charting has been done by different hands, at different times and for different purposes, and hence arises duplication, overlapping, and confusion. There is confusion in areas and authorities, but there is no less confusion in the family. There are four local authorities concerned with maternity and infancy; three with children of school age; five authorities deal with persons of unsound mind or mental deficiency; four authorities are concerned with "sick persons"; three with the aged poor; and four with the able-bodied poor. It is all anomalous, extravagant, and redundant, with a result which is ineffective and financially wasteful.

What we seem to need is, first, a single unit of health government with necessary subcommittees for particular purposes. The principles which should guide us in devising such a local authority are (a) the concentration, as far as practicable, in one authority in each area, of the responsibility for all administration of health services from local rates, with or without Exchequer grant in aid; (b) the association of the work of the Poor-law and insurance with the public health service, and the use by that service for the whole community of co-ordinated medical institutions both voluntary and municipal; and (c) the unification in appropriate committees of the local authority of all public medical provision for the sick and infirm of all ages. Clearly, there would be advantage in thus having one authority for all health purposes—and towards unification of this nature many are looking. But the question is large and complex, and there are many considerations to which regard must be paid in prescribing a unit of sanitary government, including its history, size, population, urbanisation, character of industry and society, intercommunication, rating, relation to local and central government, and so forth. If a large local unit be contemplated it would be necessary to provide for the encouragement of a consciousness of community of interest and aim in the smaller contributory or constituent divisions, with appropriate delegation of powers or functions in accordance with service to be rendered. The large autonomous body might in that way delegate some of the actual detail work to the more local bodies. There is a second, somewhat similar, common-sense requirement—namely, *uniformity of administration*—in all comparable areas. All through the country, and in all departments of State medicine, there is need for introduction of accepted standards and a larger measure of equalisation and uniformity of central and local action, yet with ample opportunity

for variety dependent on local needs and circumstances. There remains a third principle which the profession must not allow itself to forget—namely, that the local unit of health government must be *representative* of the will of the people as a whole. It cannot be wholly medical in personnel or in purpose. It must be comprehensive and disinterested. "Our trade our politics" is never sound state-craft.

Now, in devising this reform the medical profession must, in the interest of the State not less than the profession, take their share, exchanging with the layman their views on many points—the nature of the authority, its membership, the question of the co-opting of experts, finance, medical participation, the respective functioning of the different local committees, the use and adaptation of existing institutions and their economical arrangement, and the place and character of the domiciliary medical services.

The present scheme of local sanitary authorities was conceived as far back as the Royal Sanitary Commission of 1843, was actually recommended by the Commission of 1869 and legislated for in the Public Health Act of 1872, which established as many as 1539 local sanitary authorities in England and Wales, which now number 1857 (excluding the 63 counties). Experience in health administration and other forms of governance have proved the grave disadvantages of small units of local government, and the trend has been to enlarge them. The Poor-law Amendment Act of 1834 reduced the units of Poor-law administration from 16,500 to 660; the Education Act of 1902 reduced the unit of education administration from 2469 school boards to 318 local education authorities; the new Rating and Valuation Bill would reduce the units of local rating from 12,882 to 648. These reductions unquestionably make for efficiency and economy. The next step, and of its urgency there is general agreement, is to reduce the 1900 local health authorities in a similar drastic way, co-ordinating the duties of the smaller ones with those of the larger ones. We must not forget that the present scheme of local sanitary authorities (now 50 years old) has rendered great pioneer service and has given sanitation an invaluable local setting. But under modern conditions the disadvantages are overwhelming. In the smaller bodies there is all too often incompetency both of personnel and officers, combined with inadequacy of remuneration of the officers; there is duplication of officers and institutions leading to extravagances, waste, and confusion; local and personal considerations predominate, with the result that self-interest is cultivated, vested interest created, and public interest neglected; and there is lack of uniformity and equality in the administration of sanitary law common to the whole State. Yet epidemic disease spreads through large communities rather than small, and is not confined by parochial boundaries—e.g., it is impossible to grapple with small-pox or typhoid fever if one small area differs from another in the practice or neglect of essential methods. Water-supply, sewerage, river pollution, and hospital provision must also be dealt with on a general and not a particular scale. It is true, of course, that these features are characteristic of some of the smaller authorities only, but these smaller authorities are upwards of 1000 in number, and their disabilities are injuriously affecting the entire public health service of the nation. There are 1455 posts of medical officer of health, but only 350 of them are whole-time, so that 1100 medical officers of health are medical practitioners who, with all their goodwill, can only devote part of their time and energy to the public health service. Efficiency which is dependent upon the effect of divided loyalties or personal good nature can never be efficiency. In fact, it can only be, as Sir Lyon Playfair told the House of Commons in 1888, "desperately inefficient." "Wise men," said Sir John Simon long ago, "will not expect that a great national reform shall be achieved by casualties of good nature."

2. EFFECTIVE COÖRDINATION OF MEDICAL SERVICES.

I suggest that the second step in the future reform is the effective bringing together in each sanitary area of the various branches or forms of public medical service in such a way as to make them work as one connected and coöperative scheme. In science, as in war or in football, team-work is the condition of success. We must not only build on the foundations of others, but join hands with our own contemporaries. We have seen that historically the existing public medical services are the hospital, the Poor-law, factory supervision, the public health service (sanitary environment, infectious diseases, food-supply, and maternity), the school medical service and national health insurance. The problem of the complete physical supervision of a people is thus met or nearly met. Maternity, infancy, the school-child, the worker, the insured person; poverty, sickness, and old age; and all through life the essentials of a healthy environment—these things are now all separately provided for. But there are three outstanding defects. First, the provision made is as yet incomplete and inadequate; secondly, no provision is organised by law for children between infancy and school age, or for adolescents from 14 to 16 years of age (between the end of school life and the beginning of insurance); and thirdly, though we have six public medical services, there is not a sanitary area in the country in which we are at present getting full inter-coördination or even unification of administration. There is far too much of the water-tight compartment, and too many different authorities working the services. Yet until there is linking up and concentration of all forces on the focal point, it is idle to expect full effect. Though we have in England and Wales upwards of 3400 hospital institutions with 350,000 beds, there is but little correlation between Poor-law, isolation, voluntary, or special diseases hospitals. Yet in each district there should be close association under one authority between voluntary and State institutions. Though the Poor-law is now so largely medical, it is still administered on a relief basis and by bodies which are not health authorities. The factory service and the school medical service are still insufficiently connected with the local work of the sanitary authority; and above all, there is much to be done to give health insurance its rightful place as an integral factor in preventive medicine.

The great triumphs of public health work in the last century were for the most part won in the field of environmental hygiene and it must always remain our foundation. With the new century, however, there came a remarkable development. A direct frontal attack was made upon tuberculosis, a comprehensive system of school hygiene was introduced and rapidly developed, maternity and child welfare work was widely undertaken, the new knowledge of the diagnosis and treatment of venereal disease was applied gratuitously for the alleviation of sufferers all over the country, and by the establishment of the insurance medical service the State made the family doctor an integral part of our system of public health administration. It may well be that from a public health point of view it would have been more convenient if Poor-law reform had preceded the establishment of national health insurance, and if the latter had been anchored in a reorganised sanitary authority closely associated with clinics and hospital institutions. But there it is: in Britain we are not deductive philosophers, and we proceed, from precedent to precedent, "to take occasion by the hand." The fundamental fact and common ground is this, that we have in Great Britain 15,000 insurance practitioners who have entered the service of the State to care for the health of upwards of 14,000,000 insured persons in the interest of preventive medicine in its broadest meaning. The reform which our forerunners desired has come to pass, the workers have ready access to the doctor at the earliest stage of disease, with the result that the medical supervision of them

is actually threefold greater than before the Insurance Act was passed. There is more careful diagnosis; there is earlier treatment; there is better knowledge of the incidence and distribution of disease, and at a stage when it can be cured or prevented; there is, for the first time, a measurement of the relation between sickness and capacity to work. No doubt there are still many defects and inequalities in the administration of so novel a scheme. But the scheme is here; and it is for us all to make it work by integrating it with the other public medical services. If in every district medical practitioners and the medical officer of health will coöperate cordially an immeasurable advance will be made forthwith.

3. PUBLIC EDUCATION IN HEALTH.

The third reform which is needed seems to be proceeding apace—namely, the education of the people in hygiene. One thing is quite certain. We have reached a stage in the evolution of the public health when it is a necessity of further progress that we should create an enlightened public opinion and carry it with us. This is necessary, first, because there is need of an "impulse" behind sanitary legislation and effective administration of it, and secondly, because the public health is dependent upon personal hygiene and the day by day individual practice of the principles of preventive medicine. We must do more for ourselves.

All local authorities are indirectly engaged in educational health work in so far as they discharge effectually their statutory duties under the Public Health Acts, and this aspect of their work is exerting, as a study of the history of the past 50 years will show, a paramount influence on the community. It is, on the whole, the most effective and far-reaching form of health education. Some local authorities and many voluntary societies are undertaking supplementary educational work of a more direct nature, and under the new Public Health Bill of this year all authorities outside London are to be given definite and wide powers to develop this service. Section 67 is as follows:—

"Any local authority or county council may arrange for the publication within their area of information on questions relating to health or disease, and for the delivery of lectures and the display of pictures in which such questions are dealt with, and may defray the whole or a portion of expenses incurred for any of the purposes of this section."

It will no doubt be necessary before long to consider whether this work should be included in the grant-earning services, and if so whether, and on what terms, voluntary societies engaged in health propaganda should be similarly assisted. As we are evidently on the brink of a widening system of popular health instruction, I may express the considered opinion that it is the local authorities who should be mainly responsible for undertaking systematic educational health work, direct as well as indirect, suitable to their own district, circumstances, and needs, with such supplementary assistance as the voluntary societies concerned may find themselves able to furnish.

It is important that information thus afforded should be appropriate, correct, and timely. Some medical knowledge should be imparted, some knowledge of the ways and means of sanitary government, and much advice as to personal hygiene—but not one of these three should be overloaded. Exceptional facilities now exist, and the people should be encouraged to use them. Instruction should be given as to the effect of social habits and conditions on health, and that it is won by a way of life rather than a bottle of medicine. Above all, we must all learn to think of public health, not only in terms of the individual, the home or the parish, but nationally, Imperially, and even internationally. The world is both larger and smaller than in 1875, and the capacities and opportunities of human life and endeavour have been greatly and hopefully expanded.

THE
Croonian Lectures
 ON SOME
**DISORDERS OF MOTILITY AND OF
 MUSCLE TONE,**
 WITH SPECIAL REFERENCE TO THE
 CORPUS STRIATUM.

*Delivered before the Royal College of Physicians of
 London*

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LECTURE III.*

PLASTICITY: "LENGTHENING AND SHORTENING"
 REACTION.

MR. PRESIDENT AND GENTLEMEN,—The proof of the existence of the property of plasticity in muscle tone we owe to the investigations of Sherrington, who in his work on experimental decerebrate rigidity discovered that the limb of the animal, when passively flexed, say at the knee, would retain that posture, the stretched quadriceps adapting itself to the new position of the limb and holding it so ("lengthening" reaction); conversely, if the latter was again extended, the quadriceps naturally shortened, yet again contributed its quota to maintenance of the fresh attitude ("shortening" reaction). We note that in Sherrington's view this quality belongs to tone as derived entirely from somatic proprioceptive ares, and that it is demonstrated only in pathological (decerebrate) states, in which one need scarcely say various efferent paths both from the cortex and the basal ganglia are completely out of action.

In the course of my study of striatal cases much attention has been directed to the question of plasticity, and the general conclusion is, that this quality of muscle tone is not specially in evidence in these diseases. Parkinsonian limbs, passively compelled to assume a certain posture, reveal no particular tendency to maintenance of the new position. On the contrary, when left to themselves they tend to return forthwith to the Parkinsonian attitude from which they have been disturbed, that is, if the case is of average severity. A patient told me spontaneously of his frequent observation when in bed that on his extending his arms outside the bedclothes they always came back insensibly to a position near the upper part of his chest. This return to previous attitude is easily observable in the case of the hand and fingers; passive extension of the fingers is not succeeded by maintenance of the extended posture, even for as short a time as a second or two, whereas in decerebrate preparations the fresh posture is held almost indefinitely.

The feature of maintenance of different postures passively imposed on a limb is characteristic of the clinical state known as catatonia, and is not in itself dependent on the presence of extremes of rigidity. Catatonia is seen in a considerable number of morbid clinical conditions, diverse in nature but alike in that cortical function is disordered. For example, it is often noticed in the acute stages of epidemic encephalitis, it is a pronounced feature of various psychoses, of certain cases of hysteria, and so on. In respect

of outward character, the "lengthening and shortening" reaction of a decerebrate limb does not differ from that seen in any of the above-mentioned morbid states, in which, precisely, the limb muscles, in virtue of plasticity, hold it in any posture passively impressed on it. The argument is not vitiated by any claim that in these cortical and "psychical" conditions the action of "volition" is not excluded, for investigation will prove the claim to be unfounded. Now in my experience no clinical state resembling catatonia, even if merely in external characters, occurs in ordinary cases belonging to the striatal group. Applying the usual clinical tests, the observer finds little evidence of the occurrence of any reaction to be appropriately described as a "lengthening and shortening" reaction, such as Walshe, for instance, has had occasion to note in a case of decerebrate rigidity in man, and Royle, in spastic paraplegia of cortical origin (gunshot wound). I cannot therefore give any support to the view of Hunter, as expressed in his latest articles, that "a tendency for fixation of the muscle at any length passively imposed upon it" is a special characteristic of Parkinsonian rigidity. On the contrary, the cases in which it has come under my notice have been definitely extra-striatal. In view of its interest, allusion may be made to a case of my own.

The patient was an elderly man who was admitted to hospital in a semi-conscious state, with a history of having had a "stroke" 24 hours previously. On examination the right arm was seen to be in a state of "early rigidity" and in moderate flexion; the right leg was similarly rigid and extended. Aphasia was prominently in the foreground of the clinical picture. The man frequently passed his left arm over his head or moved it spontaneously about the bed, whereas the right limbs exhibited no such movements. The deep reflexes were more active on the right than on the left; the plantars were both in reduced flexion, and a crossed plantar in flexion was constantly obtained from the right sole, but never vice versa.

It was remarked at once on testing that the right limbs (arm and leg) exhibited the "lengthening and shortening" reaction in a pronounced form; as a single illustration, when the patient was put on his left side, the right lower extremity was passively abducted at the hip and flexed to a right angle at the knee, and this new (and awkward) posture was maintained for three minutes by the watch. The leg was then extended at the knee, and the quadriceps group at once maintained the extension again. The left limbs showed a similar reaction in a less noticeable degree; it was usually and more or less immediately interrupted by the "spontaneous" movements already alluded to.

On the second day the patient had two typical Jacksonian fits on the right side, beginning with twitching of the right arm, and both of these spread in moderate degree to the "second side." A diagnosis of cortical (submeningeal) hæmorrhage over the left frontoparietal region was made and this was corroborated by subsequent examination.

A case of this kind confirms the general statement made above, to the effect that the type of clinical case most likely to furnish proof of the existence of plasticity as a quality or property of muscle tone is one in which pyramidal function is disordered from the cortical side.

Passing reference may at this point be allowed to the experimental evidence on which Hunter partly relies for support of his views. In the domestic fowl and the seagull he removed the corpus striatum on one side and obtained a diffuse muscular rigidity, which he says "is remarkably similar to Parkinsonian rigidity in man. Its diffuseness, resistance to stretching, and the tendency for fixation of the muscle at any length passively imposed on it, are common to the two conditions." Now it may be fairly argued that the bird is not a suitable animal for experiments on the corpus striatum from which deductions are to be drawn as to striatal function in man, for the plain reason that it has practically no cerebral hemisphere beyond the corpus striatum; its pallium is electrically inexcitable; it has no pyramidal tracts in the ordinary sense; in its tractus striomesencephalicus (spared by the operator) mingle fibres both of striate origin and from the minute extra-striate pallium. The differences between it and

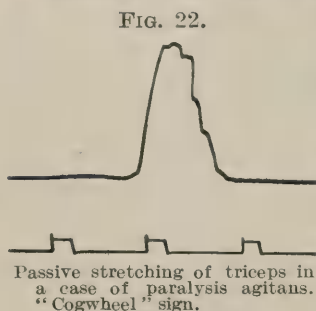
* Lectures I. and II. appeared in THE LANCET of July 4th and 11th respectively.

the mammalian brain are great enough to render comparisons as to function more than usually precarious. (The data are more specifically examined in a paper on an "Experimental Research into the Anatomy and Physiology of the Corpus Striatum," published in 1914.)

Since in the sense employed by Sherrington the reaction of plastic tone is a property of ordinary somatic proprioceptive tone, and since hypertonia characterises paralysis agitans and the other diseases at present under discussion, we might expect to be able to demonstrate at least minor degrees of the "lengthening and shortening" reaction in these affections. The well-recognised distinctions, however, between pyramidal and extrapyramidal cases must be borne in mind; prominent here is the fact that nothing like the same diminution of "voluntary" innervation obtains in the latter as in the former. Speaking generally, the subject of paralysis agitans is capable of innervating his musculature to an extent impossible in the patient whose corticospinal tract or tracts are anatomically or physiologically interrupted, and for this reason, as I consider, the lesions in his case cannot produce the pathological conditions essential for the visible demonstration of the phenomena of plasticity in any marked degree. In other words, the more serious the interruption of the pyramidal system, the more easily is this particular tone reaction excited; and it is seen at its maximum when that system is completely in abeyance, as in decerebration.

THE "COGWHEEL" PHENOMENON.

We may now consider whether the "cogwheel" symptom of Camillo Negro (1901) is connected with the reaction in question, and whether it may be regarded as a minor degree of the "lengthening and shortening" sign. When a hypertonic muscle is passively stretched it resists; and this resistance often takes the form of an irregular jerkiness, as though the muscle were being pulled out over a ratchet arrangement; it is momentarily checked and extended in a little alternating series of two, three, or more phases, hence the expression imagined by Negro. If the passive stretching is quick the phenomenon is usually more readily appreciated by the examiner. (Cf. Figs. 21 and 22.) It is not found



in the opposite muscle that is being simultaneously shortened; on active ("voluntary") movement it may be remarked both in the contracting and the relaxing muscles, but, I find, to a less extent than in the case of passive movement. Various and very different explanations have been forthcoming. Santos, for instance, an exponent of the dual theory of muscle tone, ascribes it to a clonus of the parasympathetically innervated part of muscle, but if Hunter's opinion that this part is compact of non-contractile fibres be adopted it is at once obvious these cannot of themselves be the seat of any such movement, for *ex hypothesi* they are only passively moved with the contracting fibres. Bing, who remarks that this view does not account for the occurrence of a degree of the "cogwheel" sign in active movement, seeks to explain it as a disturbance of reciprocal innervation, a release-phenomenon "produced by failure of a subcortical mechanism which ensures continuity of decontraction." It is simpler, I consider, to regard it as one of the expressions of hyperactivity on the part of somatic proprioceptive arcs. When a muscle already in contraction (hypertonia) is abruptly stretched its end-organs are stimulated and the reflex contraction promptly

reinforced, thus offering a momentary increase of resistance, felt as a sort of "catch" in the passive extension; the moment this "catch" takes place there is an immediate tendency for fixation at that point, for the muscle, being in a condition of postural overtone, will exhibit this tendency whenever it is momentarily "pulled up" (movement being the process of changing from one posture to another). In its turn the "catch" is overcome by the examiner's effort and the stretching causes a second excitation of the arc, hence again the process is gone through. If a muscle, however hypertonic, is slowly pulled out the phenomenon is so faint as to be negligible. In a sense, therefore, the "cogwheel" phenomenon may be regarded as a minor form of the "lengthening and shortening" reaction. It is not, however, confined to Parkinsonian and similar cases, though naturally more readily there demonstrable because the muscle

can in fact be stretched; in severe hemiplegic cases the rigidity may not be overcome by stretching, but when it can be the observer is sometimes conscious of a mild "cogwheel" movement. Its appearance in the course of active or "voluntary" movement of a rigid motor unit (in protagonists and antagonists) is less noticeable than during passive movement; I have not been able to satisfy myself that it is much in evidence in "voluntary" shortening, but it may be occasionally felt in "voluntary" lengthening in Parkinsonian cases (Fig. 23), where the explanation cannot be essentially dissimilar. If denervation or decontraction is not prompt enough the transient check brings about the same result because of the hypertonia.

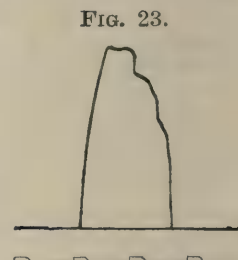


FIG. 23.

STRIATAL ATTITUDE.

So familiar and definite are the attitudes adopted in average cases of Parkinsonism (of whatever origin) and of progressive lenticular degeneration that no detailed account is required. Parkinsonian patients, young or old, all look like each other, mainly if not solely because of the "involuntary" assumption of more or less identical postures, which are at least as specific as those of hemiplegia. The attitude is one of generalised flexion, as a rule; the lower extremities are as if they were folded in moderate flexion at ankle, knee, and hip; the trunk is flexed in a concave anterior curve; the head is commonly flexed; the upper limbs are semiflexed at the elbows. At the wrists, however, extension ordinarily occurs, with flexion at the metacarpo-phalangeal and usually also at the interphalangeal joints. Very occasionally, as is not well enough known, a type of Parkinsonism with extension of head and trunk is met with.

Posture or attitude cannot be considered apart from tone-affecting mechanisms. Tone is posture; that is to say, in toneless limbs no particular posture can develop, except as caused by extrinsic agencies—e.g., gravity. Limbs whose musculature is in tone (reflex contraction) assume postures capable in the normal person of being modified instantly at the bidding of "volition," whereas in disease (pyramidal and extrapyramidal) tone-postures are a sequel to release from the control of superior, tone-controlling centres. The postural scheme of the hemiplegic is no haphazard thing; a predilection type or pattern exists, possible explanations of which have been examined in my paper on "The Old Motor System and the New." In decerebration, analogously, a selective incidence of tone on the antigravity muscles takes place. These specific postures can only be assumed if at the same time the inflow of tone to antagonistic groups is relatively lessened by reflex

inhibition. In the case of hemiplegia, tone influx is divided; in the arm, the flexor groups are hypertonic, in the leg the extensors. It is interesting and no less important to note that in each instance the groups with lessened tone are the weak muscles (e.g., the flexors, in the leg). From what has already been said of the blending of tone with muscular contractions otherwise evoked this can be readily appreciated.

Now in the case of Parkinsonian posture the circumstances differ somewhat; there is not the same "schizotonia" (to borrow a useful term recently coined by Dusser de Barenne) as in pyramidal and decerebrate conditions. The feature of paralysis agitans and kindred morbid states, from this standpoint, is the apparently indifferent or diffuse distribution of the hypertonia, as has been made the subject of allusion already. But if the increase of tone were strictly equal in each and every skeletal group of prime movers and antagonists, I do not see why resumption of postures as definite and specific as the Parkinsonian should take place after they are passively or actively disturbed. We are forced to the conclusion that, general hypertonia notwithstanding, it preponderates in flexor as opposed to extensor muscles; more precisely, in those groups (already specified) whose contraction underlies the maintenance of Parkinsonian attitudes.

On examination these muscles are seen to be firm, to have shape, and to be outlined in contraction with a distinctness as manifest as in hemiplegic groups associated with posture, and I cannot therefore agree with Hunter that in Parkinsonian rigidity there is no selective incidence, or with his corollary that only contractile tone (in his sense) is thus selective. Nor can I confirm his view that "the posture assumed in Parkinsonian rigidity is due to plastic tone only [italics mine], exhibited in agonists and antagonists." On his own hypothesis plastic tone is due to *non-contractile* fibres moved passively by contracting fibres and subsequently held thus in posture, hence the latter must first be in activity, and plastic tone of itself can do no more than support a tone-scheme previously and otherwise brought about. To exclude contractile tone, therefore, in so plain an attitude as the Parkinsonian seems impossible as well as unnecessary; finally, if plastic tone is exhibited *indifferently* in agonists and antagonists, the adoption of a specific posture is unexplained.

Of the specificity of Parkinsonian attitude there can be, in my opinion, no question whatever, but I can offer at present no satisfactory explanation of its type. No merely mechanical preponderance, as it were, of flexor over extensor contraction suffices. Hughlings Jackson drew contrasts between Parkinsonian and cerebellar attitudes, and I have myself endeavoured in other communications to seek a solution. Possibly weight should be laid on the contrast between the relative incidence of tone in decerebrate cases on the extensor or antigravity musculature ("reflex standing"), and in paralysis agitans on the flexor musculature. But the "meaning" of the latter posture is obscure. In any case, as I have argued elsewhere, the tone-picture of Parkinsonism is absolutely distinct from that of double hemiplegia; yet in decerebrate cases that of the latter is more closely approached than the tone-picture of the former, although the corpus striatum is just as completely out of action. The inferences to be drawn from these data are discussed at some length in my paper on "The Old Motor System and the New."

"FIXATION-CONTRACTION."

Much attention has been devoted, more especially by continental workers, to the question of the occurrence of what is called "fixation-contraction" in cases of striatal disease. The term is not familiar to English neurologists, but the condition has long been known under the name of "Westphal's paradoxical contraction," and consists typically of an involuntary (reflex) contraction of a muscle, of a

slow and tonic character, when its ends are passively approximated as closely as is practicable. In suitable instances it can be demonstrated in the tibialis anticus muscle by firm passive dorsiflexion of the foot, and this "tibialis phenomenon" was obtained years ago by Oppenheim in cases of paralysis agitans. In 1906 Foerster stated that "fixation-contraction" can be seen in *all* the muscles in that disease, as well as in cases of arterio-sclerotic muscular rigidity. It has been called "fixation-rigidity" by Strümpell. Jakob, also, attributes considerable importance to the phenomenon.

In routine examination of numerous examples of the various morbid affections that at present concern us special attention has been given to "fixation-contraction," following the technique of Foerster, who says the passive movement (of shortening) has to be made with a certain jerk and the limb segment pressed firmly to the end-position, the head of the bone concerned being pushed well into its socket, and the new position held passively for an appreciable moment. When this technique is prosecuted the muscle passively shortened exhibits a tonic contraction analogous to the "shortening reaction" already investigated as a property of somatic proprioceptive tone.

As a result of tests directed to this matter I have come to the conclusion that while "fixation-contraction" can be demonstrated in a fair number of cases it is neither universal in the musculature nor by any means so pronounced as Foerster would have it. In various typical cases of Parkinsonism I have failed to satisfy myself of its presence except in minor degree, and not seldom, indeed, is it negligible. A further conclusion is, that it is no more than a manifestation of increased somatic proprioceptive tone and as such is not deserving of a special terminology.

To investigate its occurrence a number of cases of well-marked unilateral Parkinsonism were selected and the condition on one side compared minutely with that of the other. The tibialis phenomenon was made the subject of special examination; another convenient test is to approximate the origin and insertion of the deltoid by passive lifting and supporting of the arm in the vertical position. Many other muscles, however, were also utilised. To convince oneself of the presence or absence of "fixation-contraction" the muscle in question was examined with the eye, was palpated with the finger (an assistant performing the passive movement), and, if it so happened that the action of gravity came into play when the limb segment was deprived of this passive support, the time taken to fall was estimated on the two sides respectively. Speaking generally, no pronounced or persistent tonic contraction in the approximated state was observed in any particular muscle—at the most, as already stated, only moderate or minor degrees of the condition could be found.

In no case have I or my assistants been convinced of the development by this method of a muscular state that can fairly be represented as belonging to the category of catatonia (or catalepsy, as both Jakob and Foerster term it, though use of the word in this connexion should be avoided). If the foot takes longer to drop through gravity on the affected than on the normal side, if as the arm falls from the vertical an evident "catch" is demonstrable just as the movement begins, this is no more than what is to be expected in a hypertonic muscle or muscle group, and cannot be thought to constitute *per se* a pathognomonic sign of extrapyramidal rigidity. There is truth in the argument of Mayer, that in some instances at least "fixation-contraction" is nothing else than a stretching contraction, such as has been already illustrated in the previous section. Even in well-marked examples of Parkinsonian rigidity, when passive shortening of a given muscle (as when the flexed lower extremity is extended to an angle, say, of 135° at the knee, the quadriceps being thereby shortened) is made, but the extreme position not attained, it is not my experience that the limb is thus held immobile by the development

of a "fixation-contraction," or, even so, I cannot assent to the interpretation put on this by the observers mentioned. At the most, it is identical with a phase of the "lengthening and shortening reaction," a property of proprioceptive tone, and merits neither separate description nor explanation.

When, therefore, Jakob maintains that the phenomenon of "fixation-contraction" is responsible for "cataleptic" (catatonic) symptoms in Parkinsonism, for the development of contractures, for adiadochokinesis and the various "pulsions," the impeding of voluntary movement, the slowing of movement at its commencement, and the interruption of movements in series, all this in my view is tantamount merely to the fact that hypertonia (exaggerated reflex contraction) of the musculature interferes with the prosecution of normal muscular action.

THE LORE OF THE ANTAGONISTS, AND THEIR RÔLE IN DISEASE OF THE CORPUS STRIATUM.

I have left to the end of my necessarily somewhat long analysis of movement and tone the *questio verata* of the nature of the part played by the antagonists in normal "voluntary" motion, and the correlative problem, whether in the motor symptoms of striatal affections any, and if so, which, are to be ascribed to disordered function of this component of movement.

In his Croonian lectures before this College (1903) the late Dr. Charles Beevor summarised the two divergent theories then in vogue as to antagonistic function: (1) According to Winslow (1756) and Duchenne (1867) the antagonists take part in all "voluntary" movements, their function being to moderate (check, control) the contraction of the prime movers or protagonists, for the sake of precision of movement. Demy (1890) drew a distinction between resisted and non-resisted "voluntary" movements; in the case of the former, the antagonists relax; in the case of the latter, they are in action during the primary movement. (2) According to Sherrington, when contraction of the principal muscles taking part in a given movement is effected by cortical (electrical) stimulation there is both relaxation and inhibition of the tone of the antagonists of this movement. Even with minimal excitation of the motor cortex relaxation of the antagonists is still obtained. From his own clinical observations Beevor concluded that in strong movements against resistance the antagonists are always relaxed, and that in unopposed movements (gravity being excluded) relaxation is the rule. In support of this second conclusion my old chief instanced the fact of the absence of demonstrable contraction in the left (say) sternomastoid when the right sternomastoid is the prime mover, as in rotation of the head to the left. Repeating this test a number of times, I am able to confirm its accuracy, but we must remember that the left posterior rotators come into action in head rotation to the left *before* the right sternomastoid does—the latter not contracting till the head is well past the mid-line—that they therefore are prime movers in the act, and, accordingly, the antagonists to the movement are constituted by the right posterior rotators. If these are examined it will, I think, be found that they do not absolutely relax, but decontract in moderating the desired movement. It is doubtful, therefore, whether the sternomastoid illustration really justifies the deduction drawn by Beevor from it.

Needless confusion has arisen from failure to appreciate the exact meaning of "relaxation" of an antagonistic group when protagonists contract. This has been taken erroneously to imply constant, complete, and immediate relaxation, whereas the words of Sherrington are that the contraction of the one muscle rises as that of the other falls, and the rise of the one keeps sufficiently close step with the fall of the other. No primary conflict between the two theories exists, nor any insurmountable difference. Amplification, however, is desirable.

To get a clear idea of antagonistic function we must bear in mind the *essential variability of antagonistic rôles*. Any stereotyped notion of antagonists being somehow "opponents" is fatal to clear thinking. We may speak of the antagonists *in a movement*, but never *to a movement*. "Opposite" muscles are not *ipso facto* "opposing" muscles. Their function ranges from (1) active coöperation in a movement, so that it is indistinguishable from that of prime movers, (2) through harmonious decontraction, as in ordinary displacements of a joint, to (3) a relaxation as quick and complete as possible, when the prime movers are acting powerfully against resistance. In illustration of this latter function, let the observer extend his arm laterally to a point well above the horizontal level at the shoulder, the deltoid being in full protagonistic action. In this position let him place his hand on a convenient shelf or ledge and make strong downward movement of the extended arm against this resistance. No displacement is possible, but the deltoid, now the antagonist in the required movement, immediately and with remarkable completeness can be felt under the fingers to soften and relax. There is here no moderating function, since no displacement as a fact occurs. In illustration of the first-mentioned function, I may cite the "straight left" of the boxer, when, accurately speaking, protagonists and antagonists as usually understood are in active coöperation, there being again no joint displacement. Beevor's illustration of the conversion of the leg similarly into a rigid muscular pillar, as when skating on the "outside edge," is equally apposite.

As I conceive it, recognition of this variability in antagonistic action will explain what might otherwise appear mutually discordant phenomena. At any moment in the course of a voluntary movement the character of antagonistic coöperation may alter according to requirements; it may change from decontraction to synergic coöperation, or again to relaxation, as the prime movers pass from kinetic to static action, or encounter resistance, and so forth. Differing modalities of function in the antagonists correspond to variations in protagonistic action. No haphazard or indiscriminate correlation, however, exists between the two; on the contrary, all is in strict physiological harmony.

As is known, the relationship of agonist contraction with simultaneous antagonist decontraction in ordinary joint displacements was described by Sherrington as "reciprocal innervation," and this "law" has received unqualified acceptance ever since its enunciation. That any conflict of the "pull-devil-pull-baker" kind should exist as between, say, flexor and extensor groups during displacement at the elbow in the direction, say, of flexion, is, in fact, both clinically and physiologically, unthinkable. He also, however, has demonstrated the occurrence and explained the nature of what he calls "double reciprocal innervation," a physiological state in which the centres for both prime movers and antagonists may discharge together, though unequally. In this way Sherrington covers the cases both of increase of protagonistic contraction with diminution of antagonistic contraction, and of simultaneous contraction (or, of reversion into rest) of the two groups.

These lectures were nearly completed when a communication by Prof. Frederick Tilney and Dr. Frank H. Pike was published in America. These investigators, experimenting on cats and monkeys, say, in so many words, that "under normal conditions we have not observed the contraction-relaxation phenomenon which is generally known as Sherrington's 'reciprocal innervation.' This phenomenon, although also observed by Beaunis in rare instances, was deemed by him both exceptional and inexplicable." Their view is that in all voluntary movements synchronous "co-contraction" takes place in the antagonists; they speak of "synergic units" composed of both flexors and extensors, and so on, and in each "synergic unit" there is a "dominant"

element (the prime movers) and a "check" element (the antagonists). During action each exhibits "a proportional mutual increment of tension," which in the case of the former is "uniformly greater" than in the case of the latter. There are also differences in the "times" when this increment of tension comes into action in the two respectively. I cannot in this place attempt any examination of their researches as these may bear on the problem before us, but I may allow myself one comment. These workers do not appear, on the clinical side, to have envisaged all the possibilities of antagonistic action, since no investigation, seemingly, either of "voluntary" movement against strong resistance, or of antagonistic coöperation, has been made. The experimental side of their research undoubtedly seems to conflict on the face of it with Sherringtonian conceptions based also on experimental methods, but all that need now be said is that I do not think there is so complete a disparity as might at first appear between some (at least) of their findings, and the usual clinical interpretation of the rôles played by muscular components in individual "voluntary" movements. With the strictures passed by Tilney and Pike, Golla and Hettwer, and others, on the imperfections of ordinary clinical methods, I am in partial agreement, but I do not admit that comparisons between cases all of which are submitted to the same technique of examination are illegitimate or uninformative, or that clinical investigation is to be renounced in favour of electromyographic technique. Indeed, Tilney and Pike enter a word of caution against basing conclusions solely on records obtained in this way.

Relying, then, on well-tried clinical procedures and their application in the clinical study of striatal disease, my conclusion is that in these affections the general laws of antagonistic action, as above illustrated, hold good. From the records of Parkinsonian cases reproduced in Figs. 15, 16, and 18, contraction and decontraction can be demonstrated just as in normal individuals. No departure from normal states of diagnostic significance has been discovered. No "defective inhibition of antagonists," that is, no marked retardation, or failure, in making a particular movement on request through inability to relax the existing tension in an antagonistic muscle, has been noted, still less any instance of the antagonists coming into action before the prime movers, as we shall see occurs in other pathological conditions to receive attention. The Parkinsonian can employ his antagonists in coöperation, and, conversely, they can be shown to slacken when the occasion demands it, according to normal physiological precedent.

I find, of course, as has been already outlined, an impediment to quick alternating movements of a limb-segment in the existing hypertonia of both of two opposite groups. It must be obvious even to superficial observation that the fingers cannot be separated ("spread") with facility or quickness by one set of interossei if the reflex tonic contraction (hypertonia) of the opposite set cannot be inhibited with facility either. For while "volition" adds a contractile element to a muscle already in "involuntary" contraction, in the sense that the two blend, its action in the antagonistic component, also in "involuntary" contraction, should be to allow the latter to elongate and yet to maintain in elongation a moderating influence requisite for the particular end to be served. Admitting antagonistic activity in joint displacement, and not a mere passive or mechanical stretching of a relaxed muscle, the truth remains that this activity of innervation, this "increment of tension," is occurring in a muscle that is in fact lengthening itself, and the question is to explain the simultaneous activity of contracting and elongating elements. Only by inhibition, as I conceive it, of a shortening contractile process (such as takes place in the prime movers) can a muscle actually elongate while maintaining contractile tension; that is to say, the process in the antagonists cannot be physiologically identical with

that in the protagonists. When a muscle is hypertonic its fibres are in a condition of greater (reflex) contraction, more tension, than in a normal muscle. If it happens to be *pro tem* an antagonist, then decontraction starts as it were behind scratch, and is adversely handicapped from the outset. Avoiding the language of metaphor, I say that more decontraction has to be effected in the antagonist (by a process of what I can only regard as inhibition) before the muscle begins to elongate, than is requisite in a normal antagonist. Hence the hindrance already alluded to, an impediment traceable through all Parkinsonian action in greater or lesser degree, and one to which many of the clinical phenomena here illustrated are in part at least attributable. Hence, in part, also, the "effort" of which the Parkinsonian patient is for ever complaining. The amount of innervation required for everyday movements, familiar to him by years of experience, turns out to be insufficient for the desired purpose; and he utters the simple confession, "it is easier not to make the movements."

An important and significant corollary arises from the conclusion to which this clinical study of striatal cases has led. Having found no abrogation of agonist-antagonist activities, no material departure from normal physiological laws except in so far as existing hypertonia causes a drag on rapidity and a reduction of facility, I am led to the decision that the normal combining of protagonist, synergic, and antagonist muscular units in a single "voluntary" movement cannot be regarded as a function of the corpus striatum. I need not at this point enter on a discussion as to the physiological level at which this combination takes place, since it will be dealt with subsequently. Suffice it to say that since the lesions of the cases under review are in all probability destructive or degenerative processes in the corpus striatum and its efferent systems, and since, as I have just pointed out, muscular components are in normal (if sometimes hampered) action as required, the mechanisms underlying their action are definitely non-striatal. Statements such as that of Lewy, therefore, that "the slackening of the antagonists during contraction of the agonists is dependent on the corpus striatum," are without either clinical or physiological foundation.

INVOLUNTARY MOVEMENTS.

Hitherto we have been concerned with an examination of two symptom-groups in the striatal triad—viz., those relating to the "voluntary" motor system, and those of muscle tone. Attention must now be directed to the question of so-called "involuntary movements."

In order to keep our study within appropriate limits I shall deal mainly with chorea, athetosis, and tremor. At the outset the caution must be repeated, that discussion of these symptoms in the present setting is not to be taken inferentially as implying for them a striatal origin. Further, the reader may with advantage recall the general comments made in my first lecture on the subject of "voluntary" movements and on the lack of precision in the meaning of the term.

The difficulties surrounding the problem may be set out as follows: (1) the classification and differentiation of the various kinds of "involuntary" movement have not been satisfactorily determined; (2) in a given case more than one type may make its appearance; (3) the movements are in many instances complicated by alterations in muscle tone, and their dissociation, however desirable for the purpose of study, is often far from easy; (4) lesions in different parts of the nervous system have at one or other time apparently been responsible for similar types of pathological movement; (5) conversely, lesions approximately in the same area have seemingly given rise to different varieties of movement; (6) the pathological findings in a particular case may be open to diversity of interpretation; (7) the evidence furnished by experimental methods has unquestionably been in some cases negative, in others conflicting.

Preliminary Considerations.

Before proceeding to clinical analysis, we must clear the ground by one or two preliminary considerations of basal significance, neglect of which still continues to be a source of confusion.

(1) It seems almost a platitude to point out that the phenomena to be dealt with are "positive" symptoms; they are over-mobile conditions; being movements, they cannot possibly be caused by impairment or destruction of movement-producing mechanisms—only paralysis, or absence of movement can thus result. Involuntary movements must be set down to *activity*, not to paralysis, of some or other motor mechanism, which must be in a physiological, not a pathological state. In every case of involuntary movement the phenomena occur during the action of *healthy* nervous arrangements, and constitute, as Hughlings Jackson insisted, a problem in physiology; they represent "physiology in difficulties." It is the more imperative to make this cardinal principle clear because it has been persistently ignored or minimised by many workers, especially in continental schools. To assign tremor and choreo-athetosis to destructive lesions of the corpus striatum is not only impossible, but ridiculous; a "hole" in the corpus striatum—for that is what outfall of parenchymatous cell-fibre systems means—cannot cause any movement whatsoever. Involuntary movements are the derivative of living mechanisms, and *our problem, therefore, is not what mechanisms are paralysed, but what mechanisms are active.*

(2) As an obvious corollary, if after the development of tremor, chorea, or athetosis a destructive lesion leads to cessation of the involuntary movement, then that lesion must be so situated as to interrupt the neural mechanism that has been producing the movement. Hence the special significance of all cases in which this class of movement has permanently ceased after a destructive lesion of one kind or another. Cases of this sort, it so happens, are rare, a fact which renders their careful investigation and recording the more desirable.

(3) A third consideration bears on the question whether the symptoms are produced by irritation, or are of the nature of release-phenomena. English neurology, following the lead of Hughlings Jackson, sees many objections to the idea of the production of year-long involuntary motor activity by irritation; yet the doctrine that excessive movement is thus caused still has adherents (Bing, for instance, still describes chorea and athetosis as "Reizsymptome," arising "when a capsular hæmorrhage implicates the neighbouring basal ganglia"). To determine the exact part played by irritation in the mechanics of symptom-production is no doubt difficult; of the precise nature of the process whereby cell activity passes from a static to a kinetic stage, we are still in complete ignorance. With some show of reason, therefore, it might be held we cannot prove that the liberation of stored-up energy is *not* due to some form of stimulation or "irritation"; even with withdrawal of inhibition some stimulus might still be postulated to initiate the discharge. The argument must be based accordingly on larger grounds.

(a) The duration of some of the cases of involuntary movement we meet with clinically puts "irritating lesions" out of court. That "irritation" should last practically a lifetime, as in some instances of Huntington's chorea, is scarcely conceivable, aside from the fact that we are equally at a loss to figure to the mind what sort of "irritation" might thus exist and continue indefinitely. It is equally difficult to imagine "irritation" of nerve-cells giving rise to the chronic tremor of paralysis agitans, or to the athetosis of an infantile cerebral hemiplegic, which may continue without ceasing for a quarter of a century or more.

(b) As long ago as 1876 Jackson said, "in some cases it seems to me to be evident that contem-

poraneously with the loss of function of a centre there is a rise in activity of the next lower centre." This is true not merely of diseased but also of healthy states. The activities of lower centres exhibit themselves freely in the absence of control from higher centres; conversely, the latter may compel the former to suspend their duties temporarily, as is readily exemplified by the action of "volition" on the respiratory mechanism. A sentence of Hughlings Jackson's, of which so far as I am aware no particular notice has hitherto been taken, seems to me to contain a truth of much significance (to which further allusion may be made); the centres of the lower physiological levels "are considerably independent of the directive influence of the higher levels, although much under their negative (inhibitory) influence." By reference to a physiological hierarchy of this kind the phenomena of involuntary movement can be more satisfactorily explained than by any process of "irritation."

(4) An integral part of the problem before us bears on the clinical distinctions between the different kinds of movement. If, as we shall see is the case, fundamental clinical differences can be established between the types—for example, between tremor and choreo-athetosis—then the probability of their being mediated by equally different physiological mechanisms becomes a practical certainty. That the same mechanism should be at one time responsible for athetosis, at another for tremor, is unthinkable. The import of this contention will become more obvious as we proceed.

CHOREA.

In reality a symptom, chorea is the name given to more than one disease. Sydenham's chorea is ætiologically distinct from Huntington's chorea; symptomatological chorea, on the other hand, is an episodic syndrome arising in the course of or as a sequel to encephalitis, cerebral vascular disease, tumours, and so on. In the two former, and indeed, unless they are exceptional, in the latter group also, the lesions underlying the clinical symptoms are characterised by diffuseness and are *ipso facto* valueless for the drawing of exact (localising) deductions therefrom; only in the case of quite small and circumscribed vascular lesions or tumours is it at all practicable to associate the choreic symptom with the pathological finding. Again, in the choreas that bear the names of Sydenham and Huntington, symptoms of a different class are frequently in evidence. Instead, then, of endeavouring to localise choreic movements by resort to an uncertain and, for the above reasons, quite unsuitable pathology, I urge the importance of the reverse procedure; we shall learn more of the nature and localisation of chorea by a precise investigation of its clinical phenomena than in any other way.

Clinical Characters of Chorea.

All of us can recognise a case of ordinarily well-marked chorea when we see it, difficult though the finding of an entirely satisfying definition of choreic movement may be. The following are some of the characters of this hyperkinesis:—

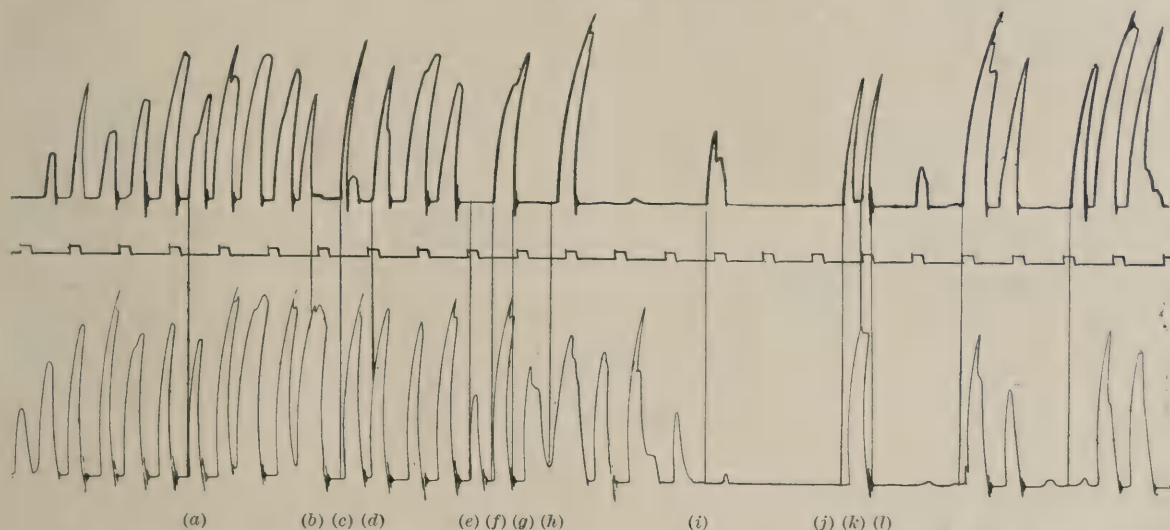
(1) The spontaneous movements of chorea offer an intimate resemblance to those executed at the bidding of volition. I mean thereby that they appear to be as complex (on occasion), as coördinated, and as purposeful as those of a frankly "voluntary" kind. Of their occasional or frequent elaborateness no doubt can be entertained; as a general rule, the muscular components of the movements take their specific physiological shares in synergia and sequence (to this rule there are important exceptions, as we shall shortly see); and each fresh movement appears to be directed to an end—which is never attained. Choreic motility may be described with sufficient accuracy as subjectively purposeful but objectively purposeless (cf. the difference between the German "zweckgemäss" and "zweckmässig"); in appearance only are the movements purposive, but to

describe them as purposeless without the qualification just given would be rather misleading.

Many previous writers have emphasised this general resemblance to "voluntary" movements. Hughlings Jackson (1873) said, "they are not mere spasms and cramps; they are an aimless [i.e., objectively aimless] profusion of movements of considerable complexity, much nearer the purposive movements of health." Again (1875), "the nature of the movements in chorea (a profusion of real movements—smiles, frowns, and gesticulations) is strong evidence that the

back into the mouth at the signal for release, is an example in point. The child shoots his arms out in front when asked to extend them; told to stand up, he rises from his chair with an almost amusing smartness and promptness. Walking down the ward and asked to turn round, he performs the movement with an abruptness that almost unbalances him. That one and the same clinical feature should characterise both "voluntary" and "involuntary" actions has an important bearing on localisation and pathogenesis, as we shall duly see.

FIG. 24.



Case of senile chorea. Upper tracing gives contractions of quadriceps and lower tracing of external group of hamstrings (R. leg.). Simultaneous record.

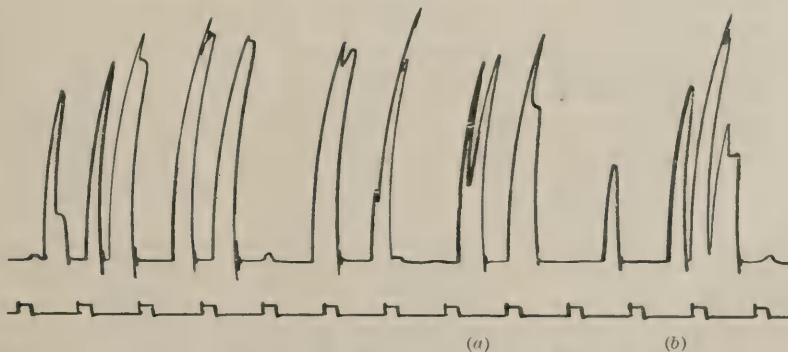
part diseased serves in highly special and complex coördinations, and thus that it is a part very high up in the nervous system." Cecil Wall, to whose excellent Bradshaw lecture on Chorea, delivered before this College in 1920, I wish to draw attention, also says: "I prefer the term 'spontaneous' to 'involuntary,' not because the latter is incorrect, but because the movements, though occurring independently of the will, are of the same type as movements executed as the result of volition."

(2) A further feature is their brevity and unsustained character, their abruptness, almost explosiveness. They rise and fall, wax and wane, with a peculiar rapidity. Occasionally, and by comparison rarely, a lingering decontraction obtains; the movement comes to an end as if with reluctance. Corroboration of the correctness of clinical observation in this respect is furnished by the electromyographic researches of Stanley Cobb, who has shown the essential similarity of the action-current curves for "voluntary" and for choreic movement, the difference residing in the shortness of the choreic contractions, as a rule, and in their lack of sustenance.

Now it is of especial significance that this feature of the spontaneous movements is equally characteristic of much of the patient's "voluntary" actions. As a fact, too, long after the "involuntary" gesticulations, as such, have vanished, the choreic child will often still exhibit noteworthy abruptness of "volitional" movement. The "choreic tongue," which flies

(3) A third point in respect of choreic movements is their separateness. However rapidly they follow each other, they do not, as a rule, blend into a continuum of motor activity, as is the case with athetosis. They remain discrete, and as long as they so remain, their coördination is comparatively undisturbed. To this rule, however, there are exceptions. On occasion, one "involuntary" movement has not ceased before its successor develops, and when coalescence of this kind occurs the clinical result is a medley of "spontaneous" muscular activity not to be distinguished

FIG. 25.

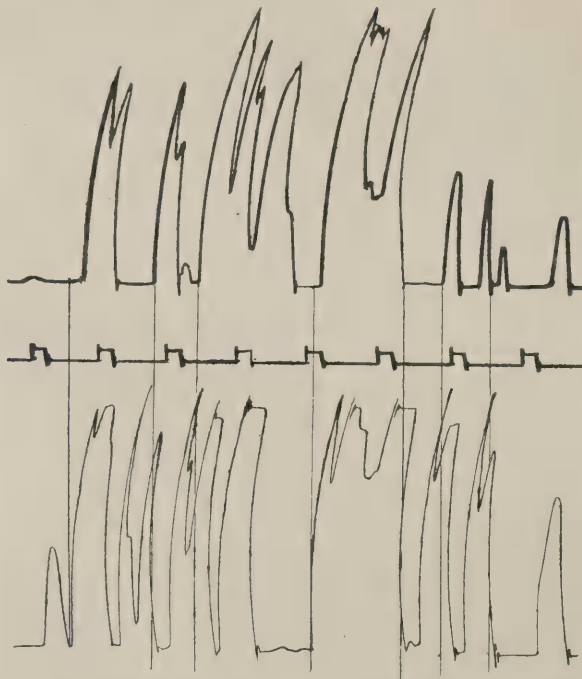


Same case as Fig. 24. Contractions of R. biceps.

in any essential particular from that of athetosis. I have had for long under my care an aggravated case of senile chorea (largely right-sided) in an old lady of over 80, from whom the records reproduced in Figs. 24, 25, and 26 have been obtained. With the slow-motion camera the apparently purposeful and coördinated nature of the never-ceasing large

and irregular movements is seen; if, however, the arm or the leg is so fixed as to minimise displacement, it is easy to convince oneself that movement follows movement in a confused, blended, and erratic fashion, and that the physiological laws governing the action and timing of the ordinary muscular components of coördinated movement are in complete abeyance. In a word, *Sherrington's law of reciprocal innervation no longer holds, disease having led to its negation*. For instance, attention is directed to Fig. 24, which gives a simultaneous tracing of the quadriceps (above) and the external group of hamstrings (below) of the right leg. Between (a) and (b) are five contractions of the extensors to four and a half contractions of the flexors, the opposite muscles contracting with practical simultaneity; the extensor contraction immediately after (c) is about twice as rapid as the flexor contraction after (c), though of practically

FIG. 26.



Same case as Fig. 24. Simultaneous records of contractions of R. biceps (above) and R. triceps (below).

the same extent; between (f) and (g) are simultaneous flexor and extensor innervations; between (g) and (h) the flexors alone contract, then at (h) both groups contract together, but flexor activity continues while extensor ceases; between (j) and (l) are two extensor innervations to one flexor, while at (k) the former commences at the very summit of existing contraction of the antagonists, yet the two end their decontraction together. Thus all sorts of pathological combinations of agonist-antagonist activity are exemplified in the record. Fig. 25 is from a tracing of the right biceps of the same case, and shows not only the complete irregularity in time and extent of the individual contractions of the muscle, but also (at (a)) how a second contraction supervenes on a first, before the latter has ceased. At (b), again, three contractions of the muscle follow on each other without a single break. In Fig. 26 are seen the contractions of the right biceps and triceps of the same case, and by comparing these as they occur between the various ordinates drawn on the record the dissolution of physiological "give-and-take" can at once be recognised. No clearer demonstration than that furnished by these and similar records of mine, of the complete interruption of normal physiological reciprocal innervation during confluent choreic activity, could be found.

(4) This interference with the action of the normal components of a movement producing joint displacement is not, as a rule, to be discovered except in what I call "confluent chorea." Years ago, however, the late Dr. Beevor drew attention to the occasional occurrence in acute chorea of what he termed the "paradoxical contraction of the abdomen." In ordinary normal coördination the diaphragm descends during deep inspiration and at the same time the recti abdominis slacken: the upper part of the abdomen is seen to come forward, or, if the subject is recumbent, to rise, with descent of the viscera associated with the diaphragmatic contraction. Now sighing inspiratory movements are fairly frequent in severe choreas, and on occasion, with inspiration, the abdominal muscles can be clearly observed to contract paradoxically, rendering the upper abdomen concave instead of, as normally, convex. Here is a definite clinical instance of lack of harmony between the constituent muscular units of a choreic movement, and of abrogation of physiological sequence.

I have studied several cases of Huntington's chorea from the standpoint of normal muscular action, using for the purpose the scheme previously described. Interruption of the normal interplay of constituent muscles is but rarely found, though when it occurs it is definite enough. For example, I have seen dissociation of the normal elevation of the eyebrows with upward deviation of the eyes, also of head extension in depression of the lower jaw against resistance. With the patient recumbent, I have seen disturbance of the normal sequence of sternomastoid, recti abdominis, and rectus femoris action in the movement of rising to a sitting position.

Both in "involuntary" and in "voluntary" movement, therefore, in the case of chorea, proof of the not infrequent interruption of physiological law in the performance of movements requiring harmonious coördination of prime movers, synergists, and antagonists, as well as in those which I have called movements of sequence, has been obtained.

The "Choreic Hand" and its Relation to "Physiological Shift."

(5) The earliest reference I have been able to find to the "choreic hand" (though not with this specific term applied to it) is in the volume by Francis Warner entitled "Physical Expression" (1885). It is constituted by flexion at the wrist and hyperextension at the metacarpo-phalangeal joints, the phalanges being straight or moderately over-extended (or very slightly flexed), the fingers usually rather separated, and the thumb rather over-extended and abducted. Warner found this attitude (to which he gave the name of the "nervous hand") *inter alios* among "those convalescent from chorea," and he also stated: "It is also often seen on one side only, especially in children convalescent from hemichorea." I have, myself, for years given attention to the choreic hand and have remarked its presence in an extremely high percentage of cases; it may persist, like the abruptness of "voluntary" movement already alluded to, long after "spontaneous" choreic movement has ceased. Without exception it will be found to be more pronounced on the side (if there be such) on which the spontaneous movements are (or have been) the more frequent. Its occurrence, therefore, must be linked with the mechanism or mechanisms implicated in the mediation of these movements.

Now, while the posture of the choreic hand may be adopted momentarily in the course of a "spontaneous" choreic movement, this is undoubtedly somewhat rare; to demonstrate it most easily the patient is asked to extend his arms in front of him. The hands then assume the posture of wrist flexion and metacarpo-phalangeal extension, often in a strikingly exaggerated form. When a normal individual is requested to hold out his hands a difference is usually noticeable according as the movement

is made energetically or gently; in the latter case they are seen to fall into a posture of moderate extension at the wrist with probably slight flexion of the fingers; in the former the fingers will be rather more extended, though the wrists will probably be extended, as before. The adoption of the choreic hand by the patient, however, is by no means merely an expression of the energetic abruptness of the "voluntary" movement, for it is readily obtained in numerous instances where the movement is not so characterised.

The choreic postural hand, as a moment's consideration shows, is the exact reverse, the "corresponding opposite," of that posture of the hand which is seen in everyone as the arms depend in rest by the side, or, for that matter, in any easy resting position—viz., extension of the wrist and flexion of the fingers—the expression of activity of the normal synergic muscles for grasping. The extensors of the wrist are the normal synergists to the antagonistic long flexors of the fingers and their physiological association is intimate, constant, and incessant. Now, as anyone can at once discover for himself, it actually requires a conscious effort to assume the choreic attitude "voluntarily," and the more pronounced the attitude the more is he aware of strain and effort in making and maintaining it. One reason, doubtless, for this feeling resides in the infrequency, indeed, the rarity, of any "voluntary" movement or posture of this particular sort. Yet this is the precise posture effected by a disordered condition of the neural centres and mechanisms concerned. That is to say, in the case of the choreic hand there is an "involuntary" (for though occurring in the course of a "voluntary" movement it is certainly not assumed consciously by the patient) adoption of a posture the exact opposite of that constantly seen in normal persons in a resting state, and of that ordinarily found in the hand when the arm is held out; in other words, a "physiological shift" occurs from one posture to its corresponding opposite. When the sole of the foot is stimulated in the normal individual a movement of plantar flexion takes place; in states of pathological function of the pyramidal system a similar cutaneous stimulus, applied in a similar place, gives rise to a movement of plantar extension—there is a physiological "shift" from one movement to its opposite. This provides us with an indirect but none the less valuable analogy by which to endeavour to explain the choreic phenomenon, and one of wide applicability, though I cannot enlarge on it further at present. The demonstration of this physiological "shift" in the case of chorea can fairly be taken to argue a condition of abnormal function of the corticospinal system, though with the immediate proviso that this abnormal state need neither be of a structural sort nor have its ultimate origin on the motor or effector side.

The Pronator Sign.

(6) Other "little signs" in chorea are indicative of a condition of disordered corticospinal function. In unilateral instances Babinski's "rising sign," described by him for cases of hemiplegia, is often obtainable on the affected side. Occasionally an extensor plantar response is found in chorea; I have seen it more than once but do not stress the point unduly. Much more frequent is the so-called "pronator sign," the arm assuming the same position of pronation or semi-pronation at the elbow as is seen in hemiplegia. When the choreic holds out his arms the thumbs are often seen to "dip" more than normally, indicative of some forearm pronation; a better way is to have the patient extend his arms above his head, when the palms are observed to turn outwards, sometimes to a pronounced degree, thus revealing an "involuntary" over-pronation at the elbow. In a paper on decerebrate rigidity in man allusion has already been made to some of these phenomena and the suggestion put forward that choreic postures—the choreic hand, the pronator sign—are *pro tanto* indicative of the partial release

from "voluntary" control of mechanisms that are wholly released in complete decerebrate rigidity. The suggestion has been quite misunderstood in certain quarters, but from what has been outlined above it will be seen to indicate simply the fact that certain analogies obtain between the results of release of function in chorea and of release in disorder, *inter alia*, of the corticospinal system. In a recent communication I have argued from clinical data that the results of complete single release (hemiplegia, paraplegia) are not identical with those of complete double release (decerebrate rigidity—cortical efferent systems plus striatal efferent systems.)

"Paralytic" Chorea.

As further evidence of the point at present under consideration, reference may be made to cases of chorea signalised rather by weakness and inactivity of a limb or limbs than by "spontaneous" movements of the same. The complaint in these cases is always one of "losing the use" of the limb. Objects are dropped from the hand; the arm hangs practically motionless; weakness of grasp is often pronounced. Such cases are by no means rare, and were described originally as "paralytic chorea" by Sir William Gowers in 1880, and as chorea mollis by Samuel West. In any ordinary case, too, some muscular weakness can usually be discovered. In my experience of flaccid chorea, the greater the weakness the fewer are the spontaneous movements; with return of power the latter may for a time increase; hence the apparent paradox that the child seems to the parents to be "getting worse" when as a fact improvement has set in.

The significance of such cases will be better understood if we bear in mind the important principle that "weakness" or hypokinesia and "involuntary movements" or hyperkinesia are but different aspects of activity of the same mechanisms; in one case there is underaction, in the other, overaction, of motor function. Hypokinetic chorea is as it were the obverse of hyperkinetic chorea; and we should not, therefore, seek a quite *different* mechanism for each, but rather expect to find that in the case of the latter the efferent corticospinal system is less disordered than in the former.

(7) The general state of muscle tone in chorea is of significance in relation to problems of localisation and pathogenesis. Commonly speaking, choreic musculature is definitely hypotonic, both as regards the usual and the "paralytic" type, and allows of greater extent of passive movement than in normal persons of the choreic age, say 7 to 15. Further, in numerous instances of Sydenham's chorea the knee-jerk exhibits that pendular character which is found in hypotonic cases of cerebellar origin. Though the hamstrings are passively stretched by the shortening reaction of the quadriceps their tone is relatively so low that a "stretching-contraction" does not take place; the leg, therefore, swings like a pendulum. The knee-jerk differs not in kind but in degree from the cerebellar knee-jerk, which exhibits the phenomenon often in a more striking fashion. (A cinematographic film of the pendular knee-jerk in chorea was shown.)

(8) One other clinical consideration remains before we seek to draw conclusions as to pathogenesis from our clinical data. Among the spontaneous movements of chorea are to be found many involving the muscles of facial expression; across the choreic's face flits an exaggerated smile, to be followed in a moment by an expression of preternatural gravity. Frowns, smiles, sighs, chase each other unendingly; when the choreic tongue flies back at a word into the mouth the face is often liable just then to be disturbed by a series of expressional activities. These transient emotional or mimic displays, however, are essentially *movements*; one does not, as a rule, observe individual muscular twitches, myoclonic contractions of individual muscles, never any localised muscular caricaturing as in facial spasm. If unilateral grimacing occurs, it offers the same features as facial tic. Almost invariably those

movements are bilateral which in health are bilateral; dissociation occurs in lower facial movements but not in upper, consonant with normal physiological law. I have not observed unilateral contractures of the frontalis, for example. We must not imagine the fragments of emotional facial expression exhibited haphazardly by the choreic to correspond to any existing emotional state of the moment; rather are they to be regarded as a release of the efferent side of the mechanism for the expression of the emotions. In a previous communication evidence has been adduced suggesting a cortical (non-rolandic) site for the central representation of mimic expression, and if this hypothesis is worthy of credence we may suppose in chorea a double condition of release: (1) the "voluntary" motor system (corticospinal system) is usurped by "involuntary" movements; (2) a normally "involuntary" efferent motor system (that for the expression of the emotions) is the seat of movements not occasioned by normal sensory (emotional) stimuli, but by abnormal (choreic) stimuli. Previous allusion has been made to the possibility of such a double release.

Summary of Clinical Analysis of Choreic Symptoms.

Summarising this analysis of choreiform phenomena, we have noted the close resemblance of choreic movements to "voluntary" movements, the existence of "little signs" pointing to disturbance of corticospinal function, the occurrence both in "voluntary" and in "involuntary" choreic action of identical clinical characteristics; we have seen the connexion between

"paralytic" and hyperkinetic chorea, and realised how these are but differing aspects of derangement of the same efferent mechanism; while the occurrence in confluent chorea (as I call it) of motor incoördination which clearly demonstrates the abrogation of the law of reciprocal innervation by disease has also been exemplified.

Now the argument from these clinical data which is here offered may be stated as follows: Complete paralysis, as in, say, anterior poliomyelitis, is never under any circumstances associated with the appearance of involuntary movements in the affected limbs; similarly, in the case of a recent, complete, flaccid hemiplegia no involuntary movement (post-hemiplegic chorea or athetosis) makes its appearance until there is clinical evidence of some return of power in the paralysed limb or limbs. Even in cases of severe chorea the corticospinal system is never "paralysed"; but where "paralytic chorea," so-called, is noted the spontaneous movements are at a minimum. It is difficult to resist the conclusion that *for the appearance of choreiform disorder relative integrity of the pyramidal or corticospinal tracts is essential*. The corollary is, that this integrity is not absolute, in view of (1) the presence of the choreic phenomena themselves, and (2) the above-mentioned signs or indications of slight concomitant corticospinal dysfunction. I repeat, however, with due emphasis, that *the derangement constituting chorea need not have its actual origin on the motor (effector) side of cerebral (cortical) mechanisms*.

Further argument may conveniently be postponed till the clinical phenomena of athetosis have been subjected to analysis.

A CASE OF HEREDITARY DEFORMING DYSCHONDROPLASIA.

BY A. G. ORD, F.R.C.S. EDIN.,
HON. ASSISTANT SURGEON, ROYAL PORTSMOUTH HOSPITAL.

THE following case of hereditary deforming dyschondroplasia seems worth recording, especially as there is available a genealogical tree of considerable interest.

The patient, a boy of 14 years, was brought to my clinic by his mother with the story that "neighbours say that the boy has broken his arm." The boy was well developed for his age, but distinctly shorter than normal. He had a markedly sallow complexion, and was inclined to be "flabby." He was said to be "dull" intellectually. On examination his right forearm, when flexed on the elbow in the fully supinated position, with his arm at the side, was found to go across his body until his right hand rested on his left shoulder. No olecranon could be felt, and on further examination the distal end of the ulna was found to terminate in a bulbous extremity some 1 inch proximal to the wrist-joint. There was marked ulnar deflexion of the hand, but no fixed deformity in any

FIG. 1.

FIG. 2.

FIG. 3.



Hip-joints and femora.

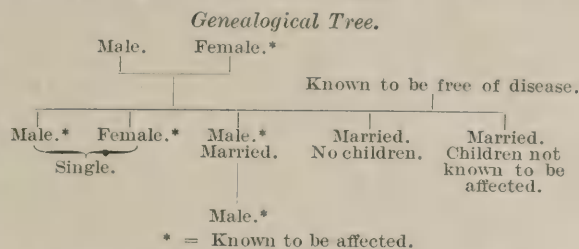
Right forearm.

Left shoulder.

way. Both humeri at their proximal extremities appeared to be expanded, and although the left arm was less affected than the right, yet many irregular bosses could be felt. Both trochanters felt larger than normal, but were not raised above Nelaton's line. Around the knees and ankles many large and irregular bony prominences could be felt. The head, spine, and scapula appeared to be free of any abnormality. The accompanying X ray pictures show the outstanding features of the case. The only complaint was that stated above. But on carefully questioning the patient—originally a left-handed boy—he volunteered the information that he had difficulty in writing with his right hand which he had been made to use at school. Again, he stated that he could not play football very well because he could not run for long, presumably due to the accompanying coxa valga. The father also submitted himself to X ray examination, although he had no complaints excepting that he noticed his hips hurt him when he put his legs wide apart. The lesions found were of precisely similar nature, but their distribution was different, the chief bones affected being ilium—a boss on the ilium being almost contiguous with the greater trochanter on the left side—femora, tibiae, and fibulae and, to a lesser extent, the bones of the upper extremities. In every instance, however, the child's deformities were far greater, as demonstrated by X rays. This may be due to a worse affection or possibly to the fact that as adult life approaches some of the cartilage gets absorbed.

The family history is of interest, and although it is not quite complete yet the genealogical tree appended suggests

strongly that the disease or abnormality is directly transmitted from a previously affected subject.



No satisfactory explanation has been offered for this remarkable condition, the most favoured theories being cartilaginous rests and thyroid or, at any rate, endocrine inefficiency. The latter is lent a little weight perhaps by these cases.

The boy was definitely a little below average in intelligence and had a peculiarly earthy complexion. The father also might possibly be indicted on the count of having said, with reference to the condition of his knees, that he thought "everyone was like this." These are, however, very slight indications and may easily be overstressed.

Medical Societies.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING was held in the School of Pathology, Trinity College, Dublin, on July 10th, Prof. J. T. WIGHAM in the chair.

W. M. CROFTON (Dublin) urged that definite evidence of the aetiological relationship of microbes to disease could be obtained by the protective and curative results obtained with small doses of the organism. The fact, for example, that minute doses of "influenza" vaccine had a favourable effect on cases of lethargic encephalitis could not be neglected in considering the cause of that disease.—J. W. MCLEOD, G. M. DUTHIE, and H. V. PHELON (Leeds) discussed the significance of the production of alkali in cultures of the meningococcus and gonococcus.—J. W. BIGGER (Dublin) had studied the hæmolysin of *Staphylococcus aureus* and found two bodies with a hæmolytic action, one heat-labile and acting on human and horse corpuscles, the other, relatively heat-resistant and produced much more slowly, acting on sheep and ox cells.—T. DALLING (London) showed that sheep could be satisfactorily protected in the field against braxy with a mixed vaccine of culture filtrates of *B. chauvei* with *Vibrio septique* toxin and antitoxin; laboratory experiments indicated that protection against blackleg could be obtained in the same way.—A. E. BOYCOTT and C. PRICE-JONES (London) found that violent exercise determined illness and death in rats fed with cultures of Gaertner's bacillus though it had no obvious ill-effect on inoculated animals.—C. PRICE-JONES and N. D. BALL (London) described a chronic epidemic of Gaertner infection in a laboratory stock of rats; in about 15 months 19 deaths occurred in some 600 animals, and when the surviving animals were killed and examined signs of infection were found in 28 of 142. The organism was of low virulence and there was little parallelism between the occurrence of the bacilli in the spleen and of specific agglutinins in the blood.—S. C. DYKE (Wolverhampton) traced the rise and subsequent fall in the number of blood platelets after splenectomy in a case of acholuric

jaundice; there was some eosinophilia, but the changes in the platelets had no apparent relation to the changes in the red corpuscles or leucocytes.—W. J. WILSON (Belfast) described a method of counting blood cells without a hæmocytometer by the use of a standard suspension of stained red corpuscles.—J. S. DUNN and NORA A. LOVETT (Manchester) had studied the later stages of experimental oxalate nephritis in rabbits. Anatomically, there was atrophy of the convoluted tubules with condensation of the connective tissue in slight cases and some fibrosis in more severe examples; the glomeruli seemed hardly affected. The functional capacity of these kidneys was tested by putting the animals on a dry diet. This normally leads to a considerable decrease in volume of urine with a rise in the urea percentage and a concentration of urea from blood to urine of about 250 times. In the nephritic animals the kidneys were almost or quite unable to effect this concentration and the blood-urea rose to a dangerous extent when water was withheld.—J. S. DUNN (Manchester) described a case of unexpected death in an infant associated with multiple hæmorrhages in the parathyroids.—A. E. BOYCOTT and C. DIVER (London) drew attention to the occurrence of monsters and very high embryonic mortalities in certain strains of snails obtained in their breeding experiments, fatality being associated with uncertainty as to the direction of the spiral twist of the shell.—J. T. WIGHAM and E. C. SMITH (Dublin) demonstrated a series of kidney tumours, W. J. WILSON (Belfast) a simple apparatus for plate cultures of anaerobes, B. W. LONGHURST (Bath) a series of microphotographs taken with the Davon super-microscope, E. E. GLYNN (Liverpool) a gonorrhoeal stricture of rectum and two large cutaneous horns, M. J. and C. STEWART (Leeds) a renal hypernephroma and a chondrosarcoma of tibia which had permeated veins, A. L. TAYLOR (Leeds) a primary actinomycosis of muscle and a very early anthrax pustule, W. G. BARNARD (London) a series of human parathyroids showing the two types of cells, an angioma of the parathyroid, and specimens showing squamous epithelium in the stalk of a normal pituitary and in a pituitary tumour.—G. S. WILLIAMSON and INNES H. PEARSE (London) reviewed the functional changes in the thyroid in the light of Aschoff's conception of the reticulo-endothelial system.—T. HOUSTON (Belfast) described experiments on the amoeboid and phagocyte activity of leucocytes in blood and pus, and a new method of doing Arneth counts.

Reviews and Notices of Books.

THE MINISTRY OF HEALTH.

By Sir ARTHUR NEWSHOLME, K.C.B., M.D., F.R.C.P. The Whitehall Series. London: G. P. Putnam's Sons, Ltd. 1925. Pp. 265. 5s.

Sir Arthur Newsholme, who was Principal Medical Officer to the Local Government Board from 1908 to 1919, provides an interesting survey of public health work. Like the other volumes in the series, it is designed to meet the needs especially of Members of Parliament and civil servants. The first chapters deal with the early institution of public health work in connexion with the Poor-law and the formation and development of the Local Government Board, culminating in the creation of the Ministry of Health. Subsequent chapters describe the gradual growth of local public health work, and the author points out as an obstacle to efficient sanitary organisation the existence of the smaller units of administration. He believes that the formation of larger units with more comprehensive duties would help to remove a certain lack of local patriotism evidenced by the failure of rate-payers to vote at local elections. Responsible local authorities for health work are not always secured, and this, the author considers, makes it hard to balance central and local control, while he holds that a preliminary training or experience in local administration would increase the efficiency of the members of public services. In a chapter on the scope of public health work it is suggested that each medical practitioner might become a medical officer of health in the range of his own practice, acting, no doubt, under the principal officer, envisaged by the creation of large areas. We gather that, in the author's view, coördination locally is more important than coördination centrally, and that the greatest need is devolution on a large scale to county councils and county borough councils and a higher measure of trust in these bodies. The existence of the majority and minority reports of the Poor-law Commission issued in 1909 did not excuse, in Sir Arthur Newsholme's opinion, the inauguration of a national insurance against sickness which ignored existing official conditions and arrangements. Both of these reports at any rate agreed that the boards of guardians should be abolished and their duties transferred to county councils and county borough councils, and as a similar recommendation was made by the Maclean Committee in 1917, it is difficult to find reasons for further delay.

Large sections of public health work, including vital statistics and quarantine questions, are not dealt with in any detail, and from the author's preface it may be gathered that he found the story which had to be told too long and elaborate for the conditions of its telling. Much, however, may be learned from its pages.

THORACIC SURGERY.

Die Chirurgie der Brustorgane. Vol. II. By FERDINAND SAUERBRUCH. Berlin: Julius Springer. 1925. 258 gold marks (=£12 18s.).

THE second volume of Sauerbruch's monumental work on the surgery of the chest contains 1075 pages, 715 illustrations, many of them in colour, and weighs 6 lb. 12 oz. The first volume, which appeared five years ago, dealt with the anatomy and physiology of respiration, the general pathology of disease of the thoracic viscera, diagnosis by means of radiology and clinical methods, anaesthesia, pressure chambers, and the general technique of thoracic surgery and special forms of operations on the lung. The present volume shows the same breadth of outlook and attention to detail. It deals in succession with the surgery of the mediastinum, the heart and pericardium, the large blood-vessels, the thymus, the oesophagus, the diaphragm, and the pleura; and included in it is the second edition of the "Technik der Thoraxchirurgie," by Sauerbruch and Schumacher,

which was issued by the same publisher in 1911. The two volumes embody painstaking pioneering work of the first order, and form the most important publication on thoracic surgery that has yet been made. The interest is not confined to the surgeon, for many aspects of thoracic disease have been considered, from secondary carcinoma of the breast involving the parietes, to tuberculosis and tumours of the lungs, animal parasites of the pleural cavity, and gunshot wounds. On each and every subject important help is given in diagnosis as well as operative technique. The bibliography extends to 110 pages. The book excels alike in composition, material, and production.

PRACTICAL CHIROPODY.

By E. G. V. RUNITING, a Founder and the first President of the Incorporated Society of Chiropractors. London: The Scientific Press. 1925. Pp. 164. 5s.

IT is many years since a treatise on chiroprody has been published in England, and this book is a great advance on its predecessors. A full account is given of the treatment of corns, plantar warts, and affections of the nails, and a useful chapter follows on the pads and plasters which the skilful chiroprodist applies after he has laid down his knife. The book is a clear indication that the modern chiroprodist is taking his calling seriously, and is using scientific knowledge to improve his work. The pupil is warned not to go outside his sphere and always to order the client to consult a doctor in cases where there is any suspicion that the trouble arises from a constitutional rather than a local cause. In place of the word "corn" the author employs "heloma," a pseudo-classic word recently coined by American chiroprodists to enhance the dignity of their calling.

LISTER AND HIS ACHIEVEMENT.

By Sir WM. WATSON CHEYNE, Bt., K.C.M.G., C.B., F.R.C.S., F.R.S., &c. London: Longmans, Green and Co. 1925. Pp. 136. 7s. 6d.

THE first Lister Memorial Lecture, delivered at the Royal College of Surgeons of England on May 14th, 1925, was reported in our issue of May 16th and is here issued in book form. Sir Watson Cheyne tells us in his preface that it was his wish to give a short history of Lister's work, but that he found it impossible to do so within his compass. The lecture illustrates Lister's character and the general plan of his work, while the details of Lister's researches and investigations appear in the form of an appendix to the book. Among the army of those who have tried to minimise human suffering, and have seen success crown their endeavour—an army in whose ranks stand John Howard, Elizabeth Fry, Florence Nightingale, Samuel Romilly, Henri Dunant, and Louis Pasteur—the name of Lister is by no means the least, and it is fitting that one who was one of his earliest pupils and most devoted follower should be the first to proclaim his master's praise in a memorial lecture. The story of Lister's struggles and success is, as Sir Watson Cheyne says, a "most fascinating tale, and its influence on the life and health and usefulness of mankind surpasses all imagination; and it is a true story." There is no reader of our pages but knows what surgery was before Lister's time, and how after his discoveries an operation was in general terms no longer the gate of the grave, but that to life and freedom from pain and suffering. No great discovery has ever been made without much toil, much anxiety, many falls and risings again, and bitter disappointments before success was achieved, and Lister in his work was no exception. The story of his life's work is now old, but it bears re-telling, and no one has told it better than Sir Watson Cheyne. Everyone, whether medical man or layman, should read this lecture, for it is a record of a struggle for the benefit of humanity crowned by success which has rarely been equalled.

PATHOLOGY.

Surgical Pathology. By WILLIAM BOYD, M.D., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital. London and Philadelphia: W. B. Saunders Company. Pp. 837. 45s.

THIS book is an attempt to present those aspects of pathology which are of immediate importance to the surgeon. Though much that is necessarily included in works on general and special pathology is omitted, enough remains to make a volume of considerable size. It is difficult to see how it could have been shortened without cramping the author's scheme. The book is divided into two parts dealing respectively with general and special pathology. The chapters on general pathology are short and concise, and we think the author has exercised sound judgment in deciding what to include and what to leave out. Special pathology is treated more fully. The book is copiously illustrated and most of the figures are excellent.

Prof. Boyd is to be congratulated on a work which will assuredly find a place in pathological and surgical libraries. Our only regret is that the price of the volume makes it unlikely that the average student will be able to include it in his personal collection.

A Text-book of Pathology. Third edition. By J. MARTIN BEATTIE, M.A., M.D., Professor of Bacteriology, University of Liverpool; and W. E. CARNEGIE DICKSON, M.D., B.Sc., Director of the Pathological Department, Royal Hospital for Chest Diseases, London. London: William Heinemann. 1925. Pp. 1103. 42s.

EXCEPT for a few minor alterations this is a reprint of the second edition of this text-book, reviewed in THE LANCET, 1921, ii., 232 and 964. The only change of any importance is one of format, for the original two volumes are now bound together as one. It is perhaps a convenience to have the whole book in one cover, though it makes a massive volume to hold; the student will probably appreciate a change which reduces the cost of a popular text-book from three to two guineas.

Pathogenic Micro-organisms. Eighth edition. By WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical School; ANNA WESSELS WILLIAMS, M.D., Assistant Director of the Bureau of Laboratories, Department of Health; and CHARLES KRUMWIEDE, M.D., Assistant Director of the Bureau of Laboratories. Philadelphia and New York: Lea and Febiger. 1924. Pp. 811. \$6.50.

THE eighth edition of this well-known text-book has been thoroughly revised and in part rewritten, and new matter, dealing with immunity, scarlet fever, measles, typhus, and tularemia, has been added. The classification and nomenclature of the Society of American Bacteriologists have been adopted, so that the book has an authoritative flavour. A large and comprehensive summary table has been added, giving the essential characters of the pathological conditions caused by the commoner organisms. It is a useful table, but the only way to prevent its rapid disintegration by wear and tear would be to mount it as a wall diagram, and it is, unfortunately, printed on both sides of the paper.

ALLEN'S COMMERCIAL ORGANIC ANALYSIS.

Fifth edition. Vol. III. Edited by S. S. SADLER, E. C. LATHROP, and C. A. MITCHELL. London: J. and A. Churchill. 1925. Pp. 732. 30s. net.

VOLUME III. of this well-known work deals more particularly with the analysis of hydrocarbons, bitumen, aromatic acids, and explosives. The section on phenols, contributed by Dr. J. B. Hill, will specially interest medical readers. A considerable amount of new work and modifications in existing analytical

methods are described, and the methods for determining the phenol-coefficient of antiseptics are given in full. The cresylic acid group of disinfectants now so widely used, either in the emulsified form or in the soluble state, are dealt with in an adequate manner. The chapter on salicylic acid and the analysis of salicylates and salicylic esters is contributed by Mr. E. Horton, who has written briefly and lucidly. The volume is well and clearly printed, and the illustrations of apparatus form a useful feature of the present edition. No laboratory, whether it be concerned with subjects so wide apart as the analysis of explosives or the examination of food and drugs, can afford to be without the volumes of "Allen" as a work of reference.

PROCEEDINGS OF THE
ROYAL COMMISSION ON NATIONAL
HEALTH INSURANCE.*

(Continued from p. 88.)

THE VOLUNTARY HOSPITALS' EVIDENCE.

The British Hospitals Association.

(App. LVII. and Q. 17127-17285.)

EVIDENCE was given on behalf of this Association by Mr. H. Wade Deacon, the Right Hon. Viscount Hambleden, and Mr. J. Courtney Buchanan. They said that the treatment of insured persons by panel practitioners was incomplete because no satisfactory provision for hospital treatment was made in the National Health Insurance Act, 1911. Since the inception of the Act hospitals have always examined and, where necessary, treated, without discrimination between insured and uninsured, cases coming to the hospitals either on reference from their medical attendants or upon their own initiative.

The number of hospitals represented by the Association is 387, of which 117 are in London. The voluntary hospitals have felt very severely the general financial stress since the war, the expenses of most hospitals having increased at least 75 per cent., and many over 100 per cent. The hospitals warmly acknowledge the support that they have received from approved societies, but suggest that much more might be done, in particular with regard to out-patient treatment, for which approved societies make no contributions. The witnesses pointed out

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247-8); The Provision of Medical Benefit (Feb. 7th, pp. 301-3; Feb. 14th, pp. 355-6; Feb. 21st, pp. 403-5); Financial Provisions of the Act (Feb. 28th, pp. 454-7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508-9); The Approved Societies and the Money Benefits (March 14th, pp. 564-5; March 21st, pp. 623-4); Evidence of the Hearts of Oak Society (March 28th, pp. 677-9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731-3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784-6; April 18th, p. 839); Evidence of Mr. Alban Gordon (April 18th, pp. 839-40); Evidence of Joint Committee of Approved Societies, of Stock Exchange and Lloyds' Health Insurance Societies, and of Group of Catholic Approved Societies (April 25th, pp. 889-91); Evidence of the National Insurance Beneficent Society (May 2nd, pp. 943-4); Evidence of the British Medical Association (May 9th, pp. 993-5); Evidence of the British Dental Association and other Dental Organisations (May 16th, pp. 1044-6); Evidence of the Insurance Committees (May 23rd, pp. 1097-8); Evidence of Various Approved Societies (May 30th, pp. 1135-6); Evidence of the British Medical Association (June 6th, pp. 1184-6; June 13th, pp. 1248-50; June 20th, pp. 1315-6); Evidence of other Medical Bodies (June 20th, p. 1316; June 27th, p. 1348); Individual Evidence (June 27th, p. 1348); Medical Services in the Factory, Ministry of Health Inquiry Room, Evidence of National Sailors' and Firemen's Union and of Loyal Order of Ancient Shepherds (July 4th, p. 36); Evidence of Friendly Societies' Medical Alliance, South Wales and Monmouthshire Alliance of Medical Aid Societies, Friendly Societies' Medical Officers' Union, Association of Approved Societies, Standing Committee of Scottish Insured Women, and Society of Medical Officers of Health (July 11th, pp. 86-8).

References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

that the out-patient special departments of the voluntary hospitals—i.e., the dental, throat, nose and ear, massage, electro-therapy departments, and special clinics—are utilised for special cases, not only in the general diagnosis of the patients' complaints, but also in their subsequent treatment and relief. All of these special departments are extremely expensive to the hospitals.

In suggesting further financial help from insurance funds, the witnesses stressed the point that they did not desire any compulsory levy, nor must there be any contract to treat insured persons as such. It was essential that the voluntary hospitals should preserve their voluntary status.

(Q. 17159.) You do not agree that a statutory requirement that the National Health Insurance funds should be drawn on for the support of the hospitals involves necessarily a certain measure of representation and control?—It is a matter of opinion, I suppose. I think that if there is a compulsory levy then there is reason for some control or some representation and that is rather my objection to anything compulsory in connexion with voluntary hospitals.

Viscount Hambleden thought that it would be dangerous to ask for anything in the nature of a block grant; what was desired was payment for services rendered. It would be objectionable to contract to give preferential treatment to insured persons. The object now is to keep the beds filled with the worst cases. Whether persons are insured or not does not enter into the question from a medical or hospital point of view.

As to financial assistance from insurance funds affecting voluntary contributions, the witnesses pointed out that—

(Q. 17170.) The Government gave a grant of half a million to be distributed by the Voluntary Hospitals Commission to help hospitals. Some people thought that would be the end of voluntary contributions. The contributions are rather bigger than they were before the grant was made.

As to the suggestion that panel practitioners referred to hospital unnecessarily cases which could be equally well dealt with by them in their own surgeries, the witnesses all agreed that no general charge of this sort could be sustained, although there might be individual cases.

The Sheffield Joint Hospitals Council.

(App. LVIII. and Q. 17286-17383.)

This Council represents seven different institutions in Sheffield, each having its own autonomy. It is a consultative and advisory body. Its spokesmen were Sir Henry Hadow and Mr. S. R. Lamb.

They said that a National Health Insurance service is not complete without the coöperation of the voluntary hospitals where the services of specialists and special equipment are available. The Council are encouraging the view that a voluntary hospital should be used largely for consultative and operative work, and a consistent effort is maintained to discourage treatment being given in the out-patient department of our hospitals which could as effectively be given by a panel doctor. In this respect they had no reason to think that there had been any abuse.

(Q. 17296.) The insured people who come to the hospitals in the first place roughly fall into three classes. There are the casualties who come because it is the nearest place; there are the people who want specialist advice, and who are recommended by their panel doctor, and come with his recommendation; and, thirdly, there is a small percentage of people who come because they do not know any better. They live in some poor part of Sheffield; they get ill and frightened, and they say: "I will go to the hospital." In those cases they come to the hospital, but I do not think there is any abuse.

It was probable that the third class were women and children mainly and not insured persons at all.

This Council suggests that the out-of-pocket expenses of maintaining insured in-patients and out-patients in a voluntary hospital should fall on the National Health Insurance funds. In any case, such expenditure by the voluntary hospitals on insured persons should, in future, be the first claim on the quinquennial surplus declared by the Government auditor.

Without wishing to suggest an exact proportion, they hoped that the contributions of societies which at present was about 15 per cent. of the cost of maintenance might go up to, say, 50 per cent.

In connexion with the voluntary character of the hospital administration and the importance that this should not be impaired, it was stated that the moral value of the contributory scheme in Sheffield is very great. It has brought 200,000 workmen into personal touch with the hospital work, and they have formed a Contributors' Council, which is of the greatest value. If grants from insurance or the public funds involved inspection, there could be no objection to this.

(Q. 17316.) On the point of representation, knowing the mind of some of the hospital boards, I think the only thing that would really frighten them would be if there was any chance of having a salaried official put in control of the work. Nothing in the way of supervision or inspection or representation would be anything else but palatable to them.

And, again, the witnesses said that their objection only extended—

(Q. 17370.) As far as having somebody permanently on the spot who was in any way hampering the autonomy of the hospitals. We should not object to anything which corresponds to the Government inspectors who come down to our University.

The Middlesex Hospital.

(App. LIX. and Q. 17384-17482.)

This evidence, given by Mr. A. E. Webb-Johnson and Mr. Walter Kewley, covered to some extent the ground traversed by the previous witnesses in so far as the need for support from insurance funds was in question, and was summarised in the form of a question by Sir John Anderson as follows:—

(Q. 17423.) The voluntary hospitals are meeting a recognised public need; they can only continue to meet that need if they receive financial support on the widest possible basis; they have, therefore, a strong moral claim on any section of the community which is in a position to contribute to their funds; in so far as approved societies have money at their disposal which could be made available for this purpose, the hospitals may properly look to those funds for a measure of support; and, quite apart from that, they are entitled to look to the individual patients, whether insured or no, who benefit by the service that the voluntary hospitals provide, to contribute according to their means.

It was recognised that support to the hospitals from insurance funds, if imposed by statute, must carry with it some inspection to see that an efficient and proper service was being rendered. The strain on the finances of voluntary hospitals did not imply any failure of the voluntary system, but it was due to the fact that the work done is greater in volume than it ever was before.

In regard to insured patients, Mr. Kewley thought there was a tendency on the part of some insurance practitioners to send patients for out-treatment which they could quite well give themselves. The witnesses thought that it was a defect of the Insurance Acts on the one hand, that no satisfactory provision is made for incurable cases which may require treatment over a lengthy period—e.g., cancer; on the other hand, the value of preventive treatment is not sufficiently recognised under the Acts.

Generally, on the need for closer coöperation between the public services and the voluntary hospitals, Mr. Webb-Johnson said—

(Q. 17482.) I would urge that this Commission, in making any recommendation, should not only have in mind the benefit to the insured person. . . . I think in recent years, when the State has been taking a greater part in the treatment of certain diseases, they have not always done it in ways which give promise of the best results. I maintain that for the sake of medical education and research and the advancement of our knowledge, it is to be deplored that when public authorities have assumed responsibility for the treatment of certain classes of disease they have not sought a closer coöperation with our great hospitals and medical schools which are the scientific centres of medical progress. It is to be hoped that these authorities will see the wisdom of establishing some of their treatment centres actually in, or in close association with, our great hospitals rather than in separate institutions.

THE LANCET.

LONDON: SATURDAY, JULY 25, 1925.

THE CANCER VIRUS.

As we indicated last week, the work of Dr. GYE and Mr. BARNARD is as significant for its promise as for its performance. "By a theory," said MENDELÉEFF, "I mean a conclusion drawn from the accumulated facts we now possess which enables us to foresee new facts which we do not yet know." The identification of the virus and the brilliant demonstration of its coöperation with inanimate substances in the production of tumours appears to give us at once a means of testing anything for the presence of either. If a mixture of any substance with a chloroformed extract of the Rous chicken sarcoma gives rise to a tumour when it is inoculated into a fowl, the substance may be presumed to contain the virus. If a chloroformed extract of any tissue inoculated into an animal of the same species along with a fresh extract of a tumour from another species of animal causes a tumour to appear, the tissue may be presumed to contain the accessory substance which Dr. GYE calls the specific factor. At present the experiments throw little direct light on the *de novo* origin of tumours; no tumour appears to have been produced except from a pre-existing tumour. But methods have been found which should quickly illuminate the question of direct causation. When a tar cancer is produced, does the virus come from outside or is it generated in the skin? What are the conditions of time and place under which the specific factor appears? The distribution of the virus can be ascertained and the conditions under which the specific factor arises in the body can be worked out. Especially we shall be most interested to hear what happens when the fundamental experiments are repeated with the substitution for tumours of normal tissues, and tissues in various abnormal states associated with death and regeneration. From the wide distribution of the virus and the absence of specificity, it seems not unlikely that it may be a normal component of the body; it has proved possible in recent years to cultivate whole cells outside the body indefinitely, and Dr. GYE's results may mean that we can now cultivate also some of those components of cells which were dreamed of and dimly seen by BÉCHAMP in his microzymes and ALTMANN in his bioblasts. If that proved to be the case, the important point in the causation of cancer would be the origin of the specific factor, and the possibilities of successful immunisation would become more remote. Or it may turn out that the virus does not normally exist in the body at all, but is generated within it in something of the same relation to the cells as the bacteriophage has to bacilli. Imagination can run on almost indefinitely, and in this case legitimately, for it is now plainly possible to submit these and many other speculations to experimental test; in this possibility lies the largest importance of the new discoveries.

There are two ways of formulating the problem of the causation of cancer. We may say: "Why do some people have cancer?" or we may say "Why does not everybody have cancer?" It is the same question, but the two ways of setting it out come from different points of view. Most people have started their thinking from the first mode of presentation. There are, however, many reasons for believing that

the body does and can resist cancer to some extent, and in all the revision of our present array of facts which the work of Dr. GYE and Mr. BARNARD has made so absorbing, it would be well to bear the second point of view in mind as well. A given chain of circumstances is not to be ruled out as a "cause" of cancer if it does not always produce cancer, and like any other mode of growth cancer is a resultant of the reaction between cells and their environment. The whole problem is being steadily cleared up. The demonstration by E. F. BASHFORD and his colleagues that something may pass out from a carcinoma cell which induces the neighbouring connective tissue to become sarcomatous, is one landmark; the discovery of the Rous chicken tumours was a second; the production of tar cancer by YAMAGIWA and ISHIKAWA was a third. The present discoveries push the experimental study of the cause of cancer a great deal further and reasonably encourage us to hope that the fundamental facts may soon be reflected in human experience.

Throughout the communications published last week in THE LANCET both authors regarded their work as requiring in many places confirmatory evidence, and obviously other experiments must be done in certain directions before more than tentative opinions can be formed. We note with pleasure the promptitude with which this situation has been recognised by the trustees of the late Sir WILLIAM DUNN, who have made a donation to the Medical Research Council of £2000 per annum for a period of five years to be used for the promotion of research work in medicine at the discretion of the Council. The Dunn trustees have already made important benefactions to the advancement of medicine, for they endowed a chair of pathology at Guy's Hospital, and another in biochemistry at Cambridge, erecting a school for the purpose; they have also built and equipped laboratories for the University Medical Clinics at St. Bartholomew's Hospital, St. Thomas's Hospital, and the London Hospital, and have given a new building for the School of Pathology at Oxford. The Medical Research Council, in accepting this generous benefaction, have intimated that for the present they will apply this special Dunn Fund in chief part to the furtherance of the organised studies of filterable viruses which they are supporting, and in particular to the recent developments of work in relation to cancer by Dr. GYE, Mr. BARNARD, and their colleagues.

THE BRITISH MEDICAL ASSOCIATION AND INDIVIDUAL DEFENCE.

THE Annual Meeting of the British Medical Association had its prelude at Bath on Friday last, July 17th, when Dr. H. B. BRACKENBURY presided over the Representative Body for the first time; on taking the chair he received an enthusiastic welcome from an assembly which knew how much the activities of the Association of recent years have owed to his enthusiasm and his industry. As will be seen from the report which we are privileged to make of the deliberations of the Representative Body, Dr. BRACKENBURY had a smooth time, for few of the motions on the agenda put forward by the Council of the Association for ratification provoked dissent, or even led to more than cursory debate. The agenda formed really a record of progress on the administrative side, while the financial statement made with great clearness by the treasurer, Mr. BISHOP HARMAN, was a cheerful one indicating that increased expenditure, even to a record figure, had been accompanied by increased revenue and increased surplus. Two motions

of the Council were, however, followed by keen discussion; the first of these was a proposal to establish a bureau for the provision of locum-tenents and assistants, and the second was a request by the Council for an authority from the Representative Body to prepare a draft scheme for a medical defence organisation to be affiliated with the Association. Both these motions had the common origin of a desire to help the recently qualified men and women, as they are recruited by the Association, and when they are faced for the first time with the necessity of finding a sphere in which to exercise their newly acquired rights, and with the accompanying necessity of avoiding professional risks.

With regard to the bureau for locum-tenents, the Council secured endorsement for the policy advocated. The opposition of existing agencies for the provision of locum-tenents and assistants, and for the sale and transfer of practices, was mentioned but discounted as negligible, and the motion for starting the bureau was approved, with the proviso that preferential treatment should be given to members of the British Medical Association. But with regard to the question of the formation of a medical defence association the Representative Body, by a substantial and possibly unexpected majority, declined to permit the Council to prepare a draft scheme along the suggested lines. The question of individual medical defence was threshed out in a debate of a high order. Dr. MORTON MACKENZIE, chairman of the Organisation Committee, produced strong reasons why the necessary authority should be given to the Council to proceed with the work of medical defence. He urged that they ought to be able to defend their new members from the outset of their professional careers; that the minority in favour of such action had through many years been growing steadily larger; and that in one form of defence—namely, "Optional and Complete"—the officers and organisation of the Association could do all that would be required through the skill and knowledge possessed by the officiate. He stated that less than 7000 members willing to pay an annual fee of £1 would render the undertaking financially secure. These propositions were supported from different points of view by various members of the Representative Body, and it was made clear from the beginning that the position of the Council in again seeking a further decision on a matter which had been settled already on several previous occasions was considered to be justified in view of an apparently growing feeling among the members that they should be offered this form of protection by the Association. But on an amendment being put forward recording the view that individual medical defence was being competently dealt with by various existing bodies, the supporters of that amendment had far the better of the debate. It became clear that the Organisation Committee had been unable to bring forward any arguments which had been calculated to persuade either the Medical Defence Union or the London and Counties Medical Protection Society that their constituencies had anything whatever to gain by coöperation. These bodies were ungracious enough to decline to commit suicide, and seem to have resented the suggestion that members of the British Medical Association should be admitted to the privileges of defence by them at a reduced scale, seeing that they existed for the protection of all qualified practitioners. Various speakers brought up for attention the strong financial position of the existing societies, who are in possession of large memberships and reserve funds, with the implication that a run of bad luck against any new defence organisation established by the British Medical

Association would wipe out the young fund or would result in considerable loss to the Association.

But probably the strongest argument of all against the projected departure was that brought forward by Dr. PETER MACDONALD and Mr. E. B. TURNER, both of whom, though from different angles, pointed out the extremely awkward situation in which the British Medical Association would be placed if a defence body, under the ægis of the Association, should find itself defending a practitioner where the conduct which had to be defended might appear ethically indefensible. This is not a fanciful position; it is one which might well occur. A defence in a court of law might prove successful before a jury which did not consider the ethical side germane to the issues, and yet that very side might later come under the disciplinary notice of the General Medical Council. Such was the line of thought which led to the Representative Body refusing to follow the lead of the Council in the matter of individual defence.

THE EVOLUTION OF HUMAN VISION.

MAN'S body, like his civilisation, is made up of a vast assortment of parts belonging to varying dates. Some of these parts, such as his heart and lungs, are of ancient lineage; others, such as his facial features and the convoluted pattern of his brain, represent recent acquisitions. His eye, on which he prides himself and through which he has learned most of what he knows concerning the world in which he lives, must be placed among his older parts. Eyes such as man has, set in sockets so that their axes are parallel, each provided with a specialised area of retina at its distal pole, each furnished with six muscles for external movements and an internal muscle for accommodation, came into existence with the evolution of the Primate stock early in the Eocene period. Binocular vision, or, to be more precise, bimacular or bifoveate vision, is thus much older than the human form; it is an inheritance from a common and distant ancestry which man shares with anthropoid apes and with all forms of monkeys—both those of the Old World and those of the New. The superiority of man's vision lies not in his eyes but in the brain which has grown up behind them. Such we take to be the chief lesson learned by those who were present at the symposium "On the Evolution of Binocular Vision," organised by the Convention of English-Speaking Ophthalmologists, when it met in London last week. The history of man's powers of vision and perception was then opened out in a masterly way by Prof. ELLIOT SMITH, who was followed by Sir FREDERICK MOTT, Prof. WHITNALL, of Montreal, and Sir ARTHUR KEITH. A brief report of these speeches is given on another page. In his Bowman Lecture, which we published last week, Sir JOHN PARSONS has made clear that the superiority of human vision is psychological, not ophthalmological.

Every infant in the development of its powers of vision bears witness to the truth of Darwinism. At an early stage of foetal development the eyes swing forwards so that their axes become parallel. Soon after birth the fovea centralis appears. While this minute area of the retina becomes specialised for acute vision, the rest of the retinal cup remains merely a reflex feeder for the central or foveate area. By the sixth week after birth the eyes begin to move together and feed their centres of acute vision. The oculo-motor and cortical centres gradually obtain control of the muscles which move the eyes; by the sixth month a stage has been reached comparable

to that possessed by adult monkeys. At the same time the muscles of the neck gain control of the head and can thus keep the eyes directed so that they may follow moving objects. Monkeys alter their field of vision by head movements rather than by eye movements. By the end of its first year a child's vision has reached a stage comparable to that of anthropoid apes—where conjugate movements become more free and temporary accommodation for near objects possible. Stereoscopic vision comes later; it begins to dawn about the third year and goes on improving up to the sixth year. These later improvements in vision depend not on the eye but on the brain. Indeed, ophthalmologists realise that it is hard to tell whether a young child's blindness is due to a defect of the brain or to one of the eyes.

With all these facts constantly before him the physician cannot well doubt the truth of evolution. Man differs from all animals in the perfection of his mental vision; compared to him all other animals are mentally blind. Human vision is Nature's greatest triumph, but it is a triumph reached by the evolution of the brain, not by the attainment of a superiority on the part of the human eye. In the oldest and most primitive of mammals the dominant sense was that of smell; their brains, as Prof. ELLIOT SMITH demonstrated many years ago, were organised on an olfactory basis. In most mammals the nose still remains a master organ. In one fortunate group of arboreal mammals, which made its evolutionary appearance early in the Tertiary part of the earth's history, the eye became the governing sense organ; the axes of their eyes became aligned; a spot in the retina, situated at the distal pole of each eye, became specialised for acute sight; bifoveate vision was thus evolved. This new form of vision entailed a reorganisation of all the parts of the brain which had to do with the movements of the eyes, and with the receipt and distribution of visual stimuli. The sight-brain gradually submerged the smell-brain. In the marmoset's brain we can still see an early stage in the evolution of the visual brain; man's brain represents the latest stage of this visual series. Between these two extremes lie intermediate links provided by the brains of various types of monkeys, the cerebral outfit of the gibbon and that of the great anthropoid apes. No one who has swept an eye along this series of brain-forms can doubt the truth of evolution, nor can he fail to convince himself that the superiority of man's vision lies in his brain, for all of these Primate animals are provided with the same kind of eye—all of them are sharers of man's bifoveate vision. As visitors to our Zoological Gardens may observe, the eye movements of the orang are almost human-like in their freedom, yet they are infinitely less effective than those of man. When the orang has swept his foveate centres over an approaching visitor he has learned whether or not there is a prospect of something to eat; with a similar glance a young woman will register the cut and colour of every article on the body of her similar.

While it is manifest that man's vision is a gift of evolutionary processes, the nature of these processes remains obscure. When DARWIN'S "Origin of Species" was first published, Mr. J. J. MURPHY, of Belfast, made the criticism that chance variations could never give rise to an organ such as the eye, which requires exact adjustment in the construction of all its parts. We now realise that the evolution of man's vision involves much more than the eye and its muscles; it involves the nerve centres which control eye movements; it involves the primary optic nerve centres of the mid-brain; it involves areas of the

occipital cortex and of the frontal cortex; it involves thousands of adjustments of all parts of the central nervous system. The skull and orbit require readjustment at each stage in the evolution of high vision. How are all of these widely scattered elements concerned in vision moved towards a common functional end during the development of the body? If the eye seems to be the *pons asinorum* of the evolutionists' Euclid, yet it has also proved to be the organ which has yielded the evolutionary key. We know now that the part of the brain which grows out to form the retina can cause any piece of embryonic ectoderm to form a lens; one embryonic element can control the growth of a neighbouring element. We know also, thanks largely to the researches of Dr. ARIENS KAPPERS, that developing nerve cells are brought under influences which cause them to take up new and advantageous positions and arrangements in the nervous system of the embryo. Thanks to the labours of experimental embryologists, we are beginning to know that developing groups of cells of one kind can give out substances—growth hormones—which can and do control the development of other and allied groups of cells. As the new prospect opens out, the evolution of man's vision, if it becomes a still more intricate problem yet becomes one which we may hope to solve. Somehow developmental processes are regulated on a functional basis; there must be a machinery at work in embryo and fetus for the common control of all parts that are concerned in vision.

PROPOSED UNIT OF CLINICAL PATHOLOGY AT WESTMINSTER HOSPITAL.

THE munificence of a private donor, Mr. A. J. H. CARLILL, recently placed the sum of £20,000 at the disposal of the board of governors of the Westminster Hospital, and this they have decided to lay out in the establishment of a unit of clinical pathology around which all the work of the hospital shall centre. So to reorganise a teaching hospital as to render it primarily an institution for the study of disease is an important departure, but the difficulties in the organisation of such a scheme are immense. The scheme as now drawn up provides that the unit shall be under the management of a director, assisted by two heads of laboratories. The director will be in supreme command of the work of the unit and upon him will devolve the responsibility of determining in consultation with his colleagues what problems are to be attacked and the manner of the attack. He will have no beds, but will be expected to work in close coöperation with the physicians and surgeons of the hospital. The director will have his own laboratories. Under him will be two assistants, each in charge of their own laboratory. To ensure coöperation between the laboratories and the wards, there will be attached to the director and to both his assistants liaison officers whose duty it will be to see that their respective heads are kept cognisant of the cases in the wards. The arrangements for coöperation between the clinical and the pathological sides would appear to be as complete as they can humanly be made. Ultimately, however, success or failure must depend upon the personality of the staff. The director and to a lesser degree his assistants will necessarily require to be men possessing a thorough mastery of the general principles of pathology in its widest sense, with at the same time a sympathetic and intelligent interest in clinical work. The general trend of medical education in this country has not been such as to produce many men of the type

who desire to master the fundamentals of medicine in order that they may the better see their way in treatment.

To many the Westminster scheme will appear to be merely an interesting experiment directed towards the placing of the teaching of pathology upon a new basis. Actually it is far more. This and all other plans of a like nature must stand or fall, not as they affect the teaching and study of pathology, but as they influence the teaching and practice of medicine as a whole.

Annotations.

"Ne quid nimis."

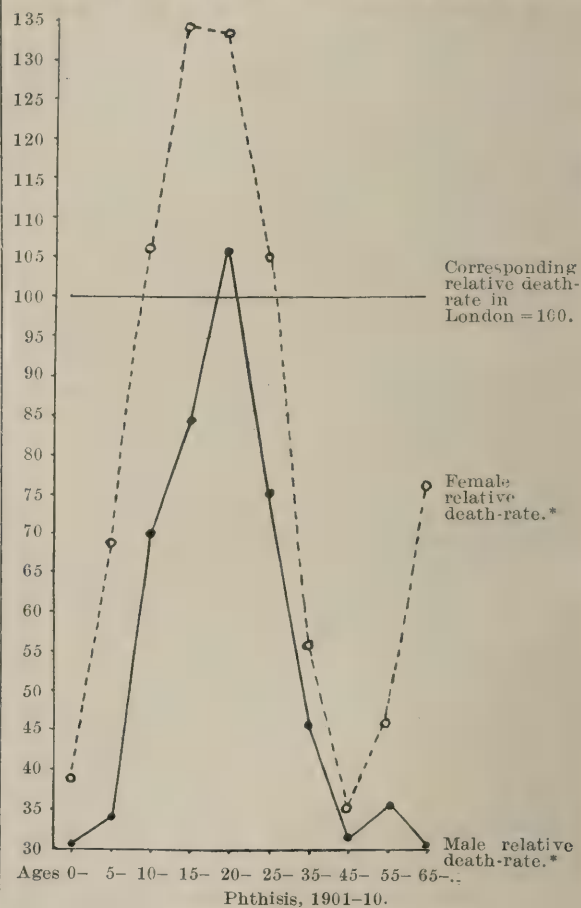
INTERNAL MIGRATION AND THE DEATH-RATE.

In a valuable though admittedly inconclusive inquiry,¹ pursued in a thoroughly scientific way, Mr. A. B. Hill has thrown new light on the problem as to what effect migration of young persons produces on the relative death-rates of urban and rural areas. The general facts obtainable from the Registrar-General's reports and quoted in Mr. Hill's report are fairly well known. Thus, in recent years the total urban death-rate for males is in excess of the rural at all ages under 75, but closely approximates to the rural rate at the age-periods 20-25 and 25-30 years. For females the urban death-rates fall below the rural rates at ages 20-30 years and occasionally also at ages 30-35. Similarly there is a higher death-rate in the rural counties from pulmonary tuberculosis at the ages of adolescence and in early manhood and womanhood, which partially explains the difference between total death-rates in urban and rural areas. The report before us seeks answers to the question why this should be, points out the difficulties inherent in the usual explanations which are offered, and throws light on the contention which has been advanced on good authority that much of the decline in the urban death-rate from phthisis is ascribable to urban migration of the more vigorous units of population and not merely to improved and more abundant food, to better housing, and to diminished dissemination of infection.

Briefly stated, the facts elicited, although not warranting dogmatic statement, appear to show that the high general death-rates from all causes in the rural parts of Essex in adolescence and early adult life are caused by corresponding high death-rates from phthisis, and that this has some relation to the migration into towns of adolescents of both sexes. The report recognises the need for evidence showing, as far as is possible, the life-history of migrants; and by securing the co-operation of clergy and others in Essex, returns have been received from some 55 villages, relating to 402 males and 367 females, of whom about one-half were migrants. It appears likely, in view of the information thus secured, that migrants have found prosperity in the town, and that their return sick to their rural homes is relatively rare. One explanation of the excessive rural death-rates at certain ages can, therefore, probably be ruled out. But it does not follow that the homekeepers—with a high death-rate in early adult life—had intrinsically worse lives. Hence an attempt is made in the report to assess their conditions in rural life as to work, to housing and environment, and to diet. No special evil condition in rural work is revealed; and although rural housing and sanitation are often unsatisfactory, this cannot be held responsible for the high mortality in early adult life, in view of the fact, not mentioned in this report but revealed by the Census figures, that there is terribly greater prevalence of overcrowding in its worst forms in towns than in rural districts.

Much valuable information is given as to rural

dieteries, and this part of the report especially deserves study by the social worker. Two-thirds of the income of the Essex families investigated was spent on food, and expenditure on boots must have meant often going short of food. This would appear to have possible direct bearing on the excessive phthisis mortality in early adult life. It is pointed out in the report that the diet would probably be most defective during the first 12 or 14 years of married life, when the father is the only wage-earner, and that this corresponds roughly with the period at which rural death-rates are high; but as against this the curves of growth and weight of Essex children show no signs of malnutrition or lack of growth. If the Essex dietary is, as appears probable, below a desirable level for rural workers, the low phthisis death-rates which are lower than those for London except at ages 20-25 for males and at ages 10-35 for females (see figure below), do not appear to be consistent with the view that malnutrition has borne a large part in the result. It appears highly improbable that the effect



* In ten rural registration areas in Essex.

of deficient food, even though the deficiency were greatest at these ages, would be limited to adolescence and early adult life. Nor can the "worse housing conditions" in rural districts, to which attention is drawn, be held to explain these differences, for surely their effect would not be shown to such a preponderant extent in early adult life; and as has been pointed out, room-famine is much greater in towns than in rural districts. In towns, furthermore, the opportunities of gross and repeated infection are much more numerous than in rural districts.

The report is a careful review of a difficult and intricate problem, presenting many variables, some of them elusive in nature. It should be studied by all social workers as a competent statement of methods of investigation, of ways for overcoming these, and of caution in deducing results.

¹ Internal Migration and its Effects upon the Death-rates, with Special Reference to the County of Essex. By A. B. Hill. B.Sc. Medical Research Council, Special Report Series, 95, 3s. 6d.

MONKEYVILLE.

MOST respectably-minded people are deeply shocked at the idea that those who are doubtful about the truth of evolution are numerous enough in Tennessee to pass a law forbidding school teachers to inculcate their pupils with the doctrine that man is in relationship with the apes. It is not a mere question of scientific conformity. Evolution has explained so much to so many of us in the last 60 years that almost everybody finds the world unintelligible without it; linking itself with the idea of progress, it has given all of us a buoyant optimism which is at once a comfort and effective. It seems almost beyond belief that there should be those who would gladly throw overboard such an admirable aid to good living. The prosecution of a young school teacher for breaking a law with which he was presumably well acquainted is, of course, of no great moment. It is the natural consequence of a rash and perhaps defiant act. Nor does it matter very much that such a law should exist. It is generally, if not universally, agreed in the United States that no religious teaching of any kind or description should be given in the public schools, and it is a reasonable corollary that anti-religious teaching should be prohibited too. And if such an understanding exists, it is compatible with common sense and toleration that very wide meanings should be attached to religious and anti-religious. It follows, too, that there are bound to be considerable and sincere differences of opinion as to where exactly the limits of these meanings are to be fixed, and it is possibly the wisest course to determine that in public education they must not even be approached.

Few people now are in the position of the majority 60 years ago in finding serious incompatibilities between science and religion. Difficulties there are and will continue to be, though they are chiefly difficulties of method rather than discrepancies in results. Revelation, for example, is not recognised in scientific circles as an appropriate way of getting information about the material world. But the existence still of a minority who find in the theories of science or, which may be more important, in the way and tone in which they are presented, something seriously discrepant with their particular religious revelation must be recognised, and if in some place they are a majority their will must prevail. Mr. Scopes has been found guilty of violating Tennessee law and (subject to appeal) has been fined one hundred dollars. But very little harm is being done either to the progress of knowledge or to the promotion of sound education. There are other educational agencies for young people besides, and perhaps more potent than, the school teachers, and those of us who do believe in evolution need not be too violent in our natural response to the new shock from America.

EXPERIMENTAL PATHOLOGY OF EPIDEMIC ENCEPHALITIS.

THE literature of the experimental pathology of this condition is a mass of contradictions, the whole dispute turning upon three debated points: The susceptibility or non-susceptibility of the rabbit to the disease, the identity or non-identity of the virus of this disease with that of febrile herpes, and the significance of certain lesions in the brains of experimental animals. On the one hand J. McIntosh, in this country, and a group of workers at the Mount Sinai Hospital in New York, have claimed that the disease is transmissible to rabbits with the greatest ease, whilst, on the other hand, S. Flexner, of the Rockefeller Institute, has stated that in many attempts he has never succeeded in doing this. A middle position has been taken up by C. Levaditi, of the Pasteur Institute, who states that the rabbit is susceptible but is only exceptionally infected successfully, and upholds at the same time the theory that the virus of febrile herpes—which produces indis-

tinguishable lesions—is the same as that of encephalitis. Amongst recent contributors to this vexed study J. R. Perdrau¹ finds that whilst direct transmission of the disease to rabbits by the inoculation of human material is generally ineffective, by certain methods which he has devised the difficulty may be overcome and infection set up. He believes that an "aggressin" is associated with the virus, and that by using an inoculum in which this is artificially increased a "take" may be assured. The substance which he uses for this purpose is the brain of an animal previously inoculated intradermally with herpetic virus and in which organ the virus is presumably present. In addition the number and routes of inoculation of the encephalitic brain are multiplied. By these means two out of three cases of the human disease provided an active virus, and by another manoeuvre a third case gave a like result. Perdrau assumes, as is necessary for his explanation of his results, that the herpetic and encephalitic viruses are identical. This is not in the least certain, and is ill-supported by clinical evidence; it is, moreover, difficult to be certain that the alleged aggressin does not contain a certain amount of active herpetic virus, or that the very intensive inoculation employed may not have been a determining factor. Flexner,² who, together with H. L. Amoss, has extensively studied the two conditions, definitely takes the view that the herpetic virus is a ubiquitous material and a very likely contaminator in such experiments. He does not, moreover, consider it merely a special variety of the encephalitic virus, and shows that whilst the serum of animals inoculated with the former exerts a neutralising action upon this virus, the serum of human cases which have recovered from encephalitis has no such effect. It cannot, therefore, be said that this crucial point has yet been cleared up.

HYGIENE IN FACTORIES.

ANYONE who compares the spirit pervading the latest annual report³ on factory inspection with one of its forerunners of 25 years ago cannot fail to note how the work of the inspectorial staff has become less that of enforcement of statutory requirements by penal prosecutions, and more that of advice and help to employers who are coming to regard the inspectors as friendly experts rather than inquisitorial detectives. Although during the period under review trade was depressed, bright spots are reported: electrical developments, motor transport, and railway plants were busy; the output of carpets, linoleum, and furniture was brisk; fish-curing was prosperous; while new industries started, such as the Schmiedal process of making sulphuric acid and refining crude petroleum from Persia. Labour-saving devices continue more and more to improve working conditions, quicken production, and minimise occupational risks. Factories again increased in number and workshops declined, and for the first time on record the former with 142,494 outnumbered the latter with 133,729; the figures portray the tendency for small places to be absorbed by the big and for power to be used to replace human effort. The section dealing with safety tells how accident prevention is being scientifically approached through attention directed to different types and causes of mishaps. Owing to an alteration in the legal definition of an accident the records are not comparable with those of previous years; but we regret to find no effort made to express accident occurrence as a rate either of those employed in different industries or of man-shifts worked—what is possible for the mining industries ought at least be attempted for factory employment. Again, attention is directed to the vast number of accidents which are unpreventable by any known

¹ The British Journal of Experimental Pathology, vol. vi., No. 3, June, 1925.

² The Journal of Experimental Medicine, vol. xli., No. 3, March, 1925.

³ Annual Report of Chief Inspector of Factories and Workshops for the Year 1924. H.M. Stationery Office. (Cmd. 2437.) 1925. Pp. 145. 2s. 6d.

protection, and can only be guarded against by safe working methods adopted by the workers themselves and also by foremen and managers. Instances are quoted of the beneficial results of "safety-first" work; both frequency rates and severity rates always fall. The outstanding wonder is that a policy which gives such great financial returns is being adopted with comparative slowness. One movement worthy of note as combining safety and health is the substitution of abrasive wheels for natural grindstones. The abrasive wheel is safer as regards accidents due to bursting, and does not, during grinding, generate fine silica dust; fortunately operations are performed better and more quickly on abrasive wheels. The abolition of the old-time grindstone and with it of "grinders' rot"—i.e., tuberculous silicosis—cannot now be far distant. The increased demand for electric accumulators for wireless sets has led to adoption of new regulations to protect workers from lead poisoning. Dust in cotton cardrooms has again called for investigation, as appliances, introduced 10 to 15 years ago for removing it, and with it "strippers' asthma," have been losing their efficiency; progress, in the light of experience gained, seems certain. More and more interest is reported to be taken in standards of illumination, and the department is lending scientific aid to employers to demonstrate how improvements may be effected; already the minimum standards recommended by the Departmental Committee on lighting are receding into the background as economically insufficient.

THE ENGLISHMAN'S HEIGHT.

WHAT is the height of the average Englishman? Is it changing gradually? Is evolution, as tested by this and other measurements of the human body, proceeding in England to-day? These are some of the questions which were discussed by Sir Arthur Keith in a recent paper before the Royal Institution of Great Britain, entitled *Concerning the Rate of Man's Evolution*. The difficulties attendant on a biometric survey of any nation or group of nations are notorious. Before the war it was commonly supposed that the average Englishman stood 5 ft. 8 in. in height, but figures gathered since have shown that is too high by at least 2 in. A popular pocket cyclopædia gives the average height of a man as 5 ft. 7 in., and if the heights of children are considered, with which Sir Arthur Keith was not, incidentally, concerned, the discrepancies between various authorities are even more marked, for striking differences have been shown to exist for country and town children, rich and poor children, in the same country.¹ If the different European nations are considered, figures from trustworthy sources go to show that the Belgian school-boy of 7, for example, is on the average 2 in. shorter than an English boy of the same age. These examples have been quoted to show how difficult it is to carry out satisfactory biometric investigations, even among living subjects, and when it comes to the measurement of fossilised remains, such difficulties are obviously accentuated. Putting aside these difficulties, however, Sir Arthur Keith was concerned with the broad question of whether evolution is proceeding at an appreciable rate at the present day in this country. Here geological and anthropological evidence appears to be at variance. On the one hand, the minute comparison of 50 skulls taken from English graves known to be at least 1000 years old with skulls of a corresponding number of men and women who had lived in England during the eighteenth and nineteenth centuries seemed to show that evolution is now at work in our midst. The palate presents the chief changes, and other modifications are seen in the configuration of the bones of the nose and jaws. The cause for this appears to lie deeper than a mere disuse of the jaws, for the changes described appear

to affect about only 30 per cent. of the modern population, although all live on approximately the same dietary. Such biometric evidence, however, is distinctly opposed by certain geological discoveries, and particularly that at Galley Hill in 1888, "The Galley Hill man," says Sir Arthur Keith. "was of the modern European type," and yet on geological evidence the stratum in which this skeleton was found fixes its age at hundreds of thousands of years, and even the more modern "cultural" investigations, based upon the workmanship of the implements found in the same strata, would assign to the Galley Hill man an antiquity of 100,000 years. If the primitive human types discovered at Piltown, Heidelberg, Java, and Rhodesia are considered in view of the fact that there is broad agreement as to the early dates at which these types lived, then evolution must have been comparatively rapid to produce modern man. As such anthropological evidence accumulates it forces the conclusion that the geological arguments connected with the Galley Hill man must be rejected. It is obvious, however, that much confusion still remains to be cleared up, and perhaps present-day anthropologists will consider their successors of many generations hence and bury an account of the measurements of an average Englishman of the twentieth century in the foundations of, say, a new Waterloo Bridge.

HOSPITAL COOKS AND COOKERY.

THAT hospital food is always monotonous and often badly cooked is a venerable complaint, sometimes true and sometimes less true. Of late, however, the difficulty of getting food for hundreds of people well cooked has been conspicuously less than that of getting it cooked at all. Most hospitals are finding that cooks, male or female, are exceedingly shy and elusive creatures, not easily tempted even by what would once have seemed a wickedly lavish display of Treasury notes. The Metropolitan Asylums Board, which has 19 large hospitals in its charge, has suffered sore things in its kitchens. In 14 of them there were 57 vacancies in six months; at one hospital the kitchen staff has been incomplete for nearly two years; in another, over a period of 11 months no assistant cook could be induced to stay for more than a month. In some of these cases there may have been exceptional local drawbacks, but this unhappy experience suggests either that there is something wrong with the pay or the conditions of service or that the expectations and outlook of the kitchen staff are unreasonable. However this may be, the Board have determined upon heroic measures. Cooking is to become (as it ought to be) a dignified service, almost, in fact, a learned profession. The invidious word "cook" is to be discarded; the artists who have hitherto suffered under that designation will henceforth be "kitchen-superintendents," and will have at their disposition aspirants for the *ordon bleu* with the title of "assistant-superintendents." These presiding officers of the kitchen (they are to be "qualified women") will be paid £200 a year, rising to £220, they will have a month's holiday in the year (about double the allowance of the doctor in the wards upstairs), and will be arrayed in a uniform the style and cut of which will probably require consideration as grave as that recently given to the outdoor costume of the registered nurse. "Kitchenmaid" has never had a very gracious sound—it conjures up too graphically visions of Shakespeare's "greasy Jane that keels the pot," and it is now to be replaced by the more euphonious title of "kitchen-assistant," with £55 a year "and all found" attached to it. If by the establishment of a culinary hierarchy, in which "kitchen assistants" may become "assistant-superintendents" and eventually "superintendents," the Asylums Board can solve its difficulties, it will have deserved well of all forms of "institution." Great numbers of clever and competent women, even when they hold a cookery certificate, find it impossible

¹ The World's Health. May, 1924. Pp. 145.

to earn £200 a year, plus board and lodging, and such terms ought to attract a class which, in addition to being reasonable and contented, can cook a potato, and actually knows when a rice pudding is "done." We understand that in some general hospitals an expert "food adviser" has been appointed, whose duties comprise the choice of an adequate variation of the diets, the collection of the food at the best markets, and supervision of the kitchen staff, with the responsibility for seeing that the food is efficiently cooked, and that it is served to the wards hot and convenient for distribution to the patients.

POOR-LAW HOSPITALS AND TUBERCULOSIS.

REFORM of the Poor-law, although placed in the forefront of the political programme, has not yet taken very definite shape. The Minister of Health announced in Parliament on May 27th that he proposed to begin by transferring administrative functions without altering the present law. Two circulars (607 and 607A), dated July 21st, issued to boards of guardians and municipal councils respectively, indicate one direction in which the Ministry of Health is proposing to secure effective coöperation within the limits of the existing law. There are at present in Poor-law institutions a number of cases of pulmonary tuberculosis at a stage which affords reasonable prospect of arrest of the disease. Such cases would be better in a residential institution run by a local authority under a tuberculosis scheme. To attain this measure of coöperation the Ministry makes the reasonable suggestion to boards of guardians that they should appoint the local tuberculosis officer as consultant at the Poor-law institutions. The guardians would then have the benefit of the clinical services of an officer with personal knowledge of the medical history of the patient. The tuberculosis officer would be requested to examine the patient either before admission or as soon as possible after admission to the Poor-law hospital, with a view to consider whether the case is one for sanatorium treatment. The Ministry goes on to advise boards of guardians, contemplating additional accommodation for tuberculous patients, to consider whether this provision should not be ordinarily undertaken by county and borough councils. Further accommodation for the treatment of non-pulmonary tuberculosis is earnestly commended to the attention of these councils, as well as a proper orthopaedic scheme for dealing with the crippling deformities of children. The recommendations of the Ministry, if carried out, will anticipate in one direction the need for Poor-law reform.

THE sudden death occurred last week at the age of 67 of Mr. F. E. Beddard, D.Sc., for many years prosector to the Zoological Society of London. Frank Evers Beddard, who was educated at Harrow and New College, Oxford, made his first mark in science as one of the naturalists who worked out the material collected by the *Challenger* expedition. Many of his contributions to mammalian anatomy were thoroughly original, and he was elected to the Royal Society while quite a young man. He wrote the volume on mammals in the Cambridge Natural History, and several interesting monographs on such subjects as the classification of birds, the geographical distribution of animals, and the natural history of whales. To THE LANCET he sent frequent and illuminating notes on zoology, in which his use of simple language for the description of technical matter was remarkable.

INDEX TO "THE LANCET," Vol. I., 1925.

THE Index and Title-page to Vol. I., 1925, which was completed with the issue of June 27th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXII.

THE TREATMENT OF EPIDEMIC DIARRHŒA.

ALTHOUGH the prevalence of infantile diarrhœa in the hot months has been noted for centuries, there is still no common agreement as to its cause. While it is generally accepted that bottle-feeding, heat, and infection all play a part, it is still a matter of dispute whether it is purely a zymotic disease or whether the remaining factors are primary. Probably the majority of cases are due to an extended form of the diarrhœa (usually fermentative) which occurs in infantile dyspepsia and are, therefore, more in the nature of a chemical disturbance of digestion, the rôle of bacteria being only secondary. With the facts so uncertain, it is better, from the practical viewpoint, while taking every precaution to exclude extraneous infection (by milk, dirty utensils, and so forth) to pay equal attention to the composition of the food and, in particular, to the avoidance of mixtures too rich in sugar, especially when combined with much fat. Lately, suspicion has been cast on the whey.

The fact that epidemic diarrhœa is limited to hot weather makes it evident that the effects of a high temperature must be accounted the most important of exciting causes. It is probable that heat not only influences unfavourably the digestion and absorption of food, but also by depressing vitality helps to lower the power of resistance.

The Clinical Picture.

The clinical picture varies according to the severity of the condition. In the milder cases the diarrhœa is accompanied by slight fever without much general disturbance. In the more severe types, of which the "choleraic" represent the extreme, the symptoms lose their purely alimentary character and become widespread. This change is dependent mainly upon loss of fluid and upon toxic absorption. Evidences of this are found in the rapid loss of weight, inelastic skin, pinched features, sunken eyes and depressed fontanelle, rapid feeble pulse, and anuria. Toxic symptoms are chiefly conspicuous in the nervous system in the form of restlessness, drowsiness, and finally coma. Another leading symptom of this class may be "air hunger," evidenced by rapid, deep, and often irregular breathing. In detailing therapeutic measures one would first urge the necessity both of studying the clinical picture as a guide to treatment and of watching these patients from hour to hour, in view of the rapid advance.

There are two distinct phases—the acute one, where the main indication is elimination by stopping all food and evacuating the bowel; and the later one, which the main problem is to find a suitable diet.

The Management of a Case.

1. *General Measures.*—If there is much collapse a mustard bath (at 100° to 105° F.) should be given. After this the child should be put to bed and kept warm in a well-ventilated room or even in the fresh air. The clothing should be light, and scrupulous cleanliness in the child's person should be secured. Napkins must be changed frequently and removed from the room. Excoriation of the buttocks can be prevented by cleanliness and the use of starch and boric powder; in the event of the buttocks becoming sore an efficacious application is lime-water and olive oil in equal parts. The baby should be bathed twice daily with tepid water and the mouth carefully swabbed with cold water.

2. *Elimination.*—If there is abdominal distension with fever and offensive stools, castor oil should be given, or, if this is vomited, calomel gr. $\frac{1}{2}$ may be

tried; but in cases in which the diarrhœa is already profuse further purgation will only do harm. Early irrigation of the colon with normal saline is advisable in all cases as it hastens the effect of the cathartic and removes offensive material. This should be done two to three times a day on the first day and only once a day afterwards, for prolonged treatment of this kind will merely exhaust the child.

3. *Restorative Measures.*—Thorough evacuation, no food, and plenty of water form the essentials of treatment in the first 24 hours. A bottle should be kept filled with half strength normal saline and offered to the baby when awake. Though the degree of recovery by this method alone is often surprising, in most cases further measures are necessary to make good the dehydration. The simplest is the subcutaneous injection of 2 to 3 oz. of normal saline (at temp. 105°) into each side of the abdominal wall, though the amounts should be regulated by the rate of absorption. 5 per cent. glucose is an alternative for infusion.

In urgent cases saline may be injected into the peritoneal cavity, a method which allows of large amounts being given quickly, and of more complete absorption. This is a safe procedure, under aseptic precautions, if care is taken to relieve abdominal distension and to empty the bladder; 6 to 12 oz. at a temperature of 100° may be given in this way, slowly, by the gravity method.

Of stimulants, brandy (M 5-10) well diluted, given every one to two hours, is the best. The value of many of the stimulants often advocated is debatable: but if there is acute circulatory collapse with rapid pulse, M 1-2 of 1/1000 adrenalin chloride hypodermically is certainly effective. Camphor in olive oil (gr. ¼ to M 5) may be tried in desperate cases.

The injection of 10 to 15 c.cm. of human blood, with the idea of increasing immunity, has seemed beneficial in some cases, but further evidence is required.

4. *Diet.*—All food must be withheld for 12 to 36 hours until the acute symptoms subside, boiled water, weak tea, or weak barley-water being allowed. Starvation at this stage is essential.

The next stage, the return to food, presents difficulties. What may suit one case may not suit another, because, as already stated, the causal agents are not always the same. While ideally, perhaps, the mode of treatment should be suggested by the predominant type of organism (proteolytic, fermentative, &c.), this is not a practical proposition. Though no definite rules can be laid down, certain general lines may be indicated. Whatever kind of food is chosen it is important (a) to give small feeds at first, (b) to make additions slowly, (c) to note the effect of increases of food on the temperature, the general condition, and the stools, though it is not always wise to wait for too great an improvement in the latter. Milk is best avoided until the temperature is nearly normal, and, in all cases, when feeding is recommenced, fat is best omitted entirely at first unless albumin milk is used. Some help may be gained from the child's reaction to starvation. If there has been a decided improvement and a fall in temperature, success is often attained on a mainly protein diet, especially in those cases where the stools have been strongly acid. This may be given in the form of skimmed milk, fresh, or perhaps better, dried (such as Cow and Gate or Trufood), added cautiously to the water, giving at first ¼ to ½ oz. every second feed and gradually increasing if improvement is maintained. The next step, the stools now being formed, is to add sugar in small amounts. The safest variety of sugar is undoubtedly dextrin-maltose, as it tends to ferment less easily than lactose. Finally, a half-cream dried milk or ordinary milk and water mixtures may be embarked upon.

As an alternative albumin milk may be prescribed; in dried form this has proved useful in my hands. Its value lies in the fact that while containing little sugar and whey the protein content is high and lactic acid is added. Whey may be well tolerated after the starvation period, but while satisfactory in milder types, it does not always prove so in the severest ones and is hardly to be recommended as a routine. To

cases developing an infective colitis, recognised by the persistence of the temperature and by the continued frequency of the stools which become mucoid and contain blood, it is better to give foods containing little residue, and if skimmed milk does not agree, better results may be obtained by a malted milk or whey with added Benger's food. Fat is badly tolerated and should be ordered with care. Finally, if breast milk is available it may be given on the second or third day, and is superior to any other form of feeding.

5. *Drugs.*—Though they have their use, too much reliance must not be placed on medicines to the exclusion of the more important general measures. Opium is the most valuable, and is specially indicated when the stools are very frequent and there is much pain; it is perhaps of the greatest service in the choleraic cases. It must, however, be used with discrimination, and as a rule should not be prescribed in the early stages before the bowel has been emptied, if there is collapse, or if the motions are small and offensive while the tongue is furred. It may be exhibited as tinct. opii (M ¼ at six months, M ½ at one year) four-hourly, or as pulv. ipecac. co. (gr. ½ at three months, gr. ¼ at six months) six-hourly.

After the initial stages when the diarrhœa is less but still persistent, small six-hourly doses of castor oil are valuable (ol. ric. Mj. with mucilage). Another plan is to alternate this mixture with a combination of hyd. c. cret. and pulv. ipecac. co., a dose of each being given three times a day. Bismuth, if ordered in large doses (gr. 5 to 20 from a few weeks to a year old), may be effective, especially when the large bowel is affected.

Special Symptoms.

Persistent Vomiting.—After a preliminary wash-out of the stomach with a weak sod. bicarbonate solution vomiting is, in many cases, controlled merely by reducing the feeds in size. If even small sips of water are rejected, feeding by mouth must be stopped and recourse had to saline injections to supply the necessary fluid. Drugs are of little value with the exception of morphia, which may be given hypodermically (gr. 1/100 at three months) in urgent cases when other methods have failed.

Hyperpyrexia.—A persistently high temperature (105° F.) should be relieved either by tepid sponging or by the application of a cool pack. This latter method helps to control not only the high temperature but also the nervous symptoms which accompany it. If restlessness is extreme sedatives may be given.

Ketosis.—Where there is clinical evidence of this state (stupor, air-hunger, acetonuria) it is best treated by giving plenty of fluid and, specifically, 5 per cent. dextrose solution (intravenously), which provides a more rational and safer treatment than alkalies.

Tenesmus.—This is best relieved by rectal irrigation with warm saline, combined, if need be, with doses of silver nitrate (gr. 1/12 to 1/6) or opium by mouth.

Prophylaxis.

The comparative immunity of the breast-fed is a testimony to the importance of breast-feeding, and if a child is on the breast it is unwise to wean during hot weather. Babies who have had previous dyspeptic disorder so readily fall victims to the disease that great care should be taken to see that prescribed mixtures are rational ones, and that upon the slightest sign of indigestion immediate steps are taken to correct this and to modify the feeds to suit hot-weather needs. Over-feeding by giving excess of milk, instead of added water, to satisfy thirst must be guarded against. The food should be prepared with care, fresh milk should be boiled, and if not beyond suspicion should be replaced by a dried milk. Attention to the details of the nursing care and hygiene of the child and his protection against the excessive heat by light clothing and adequate ventilation of the rooms contribute not only to his comfort, but also to the prevention of what may prove a serious disease.

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Special Articles.

SOME GENERAL REFLECTIONS ON PUBLIC HEALTH ADMINISTRATION.

By J. H. L. CUMPSTON, M.D. MELB., D.P.H. LOND.,
DIRECTOR-GENERAL OF HEALTH, COMMONWEALTH OF AUSTRALIA.

II.—THE MEDICAL PRACTITIONER AND PUBLIC HEALTH.*

In that magnificent statement—"An Outline of the Practice of Preventive Medicine" (1919)—Sir George Newman embodies "the law and the prophets" of preventive medicine. In his summary of the present status and future prospects of preventive medicine he says:—

"It is clear that such a policy as that which is here outlined calls for an adequate medical service and the appropriate administrative machinery. The foundation of a medical service is the medical practitioner. He is its pivot, its anchor, its instrument. If he is competent it has the first surety of success; if he is ineffective or ill-equipped it must fail" (pp. 100–101),

and he also quotes the Editor of THE LANCET as saying:—

"The prevention of disease is as much the rôle of the practitioner as is the cure and care of patients."

About the same period the present writer, addressing the Australasian Medical Congress said:—

"The medical practitioner cannot escape his responsibility to the nation. He has the knowledge, or is, at least, in the best position to acquire the knowledge; he has the patient under his hand from first to last; he has the confidence of the patient and his friends; and, of all conceivable agents, he is in the best position to apply effective measures of preventive medicine. He must accept his responsibility and must accustom himself to a state of mind in which he would feel the same shame at a secondary case of infectious disease in a family amongst his patients as he would at sepsis after an operation. The aseptic conscience must be sensitive to all forms of preventable disease, not merely those due to errors in surgical technique."

The General Medical Council of Great Britain has recently revised the medical curriculum in the interests of the

"ever-widening subject of preventive medicine. The Council recommends that the subject should be a pervading influence all through the curriculum, affecting every subject in it, so that the student naturally and almost unconsciously adopts in his daily practice of medicine the attitude and spirit of prevention."

If the importance of the general practitioner is so great that "if he is ineffective public health must fail," the first inquiry that must be made is what actual steps have been taken by either the national governmental authorities or the elected governing directorate of the medical profession to ensure that the general practitioner is worthy of his high calling and that he is sufficiently well-trained, well-organised, and well-supported to be effective. It can be said at once that in neither the United Kingdom, the United States, nor Australasia has a complete organisation been developed which makes full use of the general body of the profession or gives in any way a satisfactory plan for the transferring of the edifice of public health to its proper "foundation"—the medical practitioner. There is no doubt as to the necessity for devising such a plan, and it is interesting to review certain attempts which have been or are being made towards this end.

The State of Alabama, U.S.A.

Perhaps the most striking, certainly the most interesting, although not the most valuable, attempt to attain this end is found in the legal code of statutes of the State of Alabama. The basic organisation

of the State public health system is found in the following extracts from the Health Laws:—

"The Medical Association of the State of Alabama is the State Board of Health. The State Board of Censors of said Association shall be known as the State Committee of Public Health. The boards of censors of county medical societies in affiliation with the Medical Association of the State of Alabama shall be known as county boards of health of their respective counties, including all incorporated municipalities therein, and shall be under the general supervision and control of the State Board of Health."

The actual status in practice of this arrangement is best indicated by the preface to the "Public Health and Medical Laws of Alabama" (1920 edition), written by Dr. S. W. Welch, State health officer.

"The State of Alabama has been magnanimous in a legislative way to her medical profession. Perhaps in no other Government of the world has a like spirit of confidence in, and generosity to, her medical men been crystallised into law."

In support of this declaration the following examples are given:—

1. The State has wholly and entirely entrusted to her organised medical men the right of deciding who shall be admitted to their ranks, thus enabling them to elevate the standard of qualification of the practitioners of medicine in the State to such plane as they may desire, thereby protecting the people against the evils of ignorance, quackery, and dishonesty.

2. She has provided that her health boards—State and county—shall consist of medical men exclusively, and endowed these boards with the important legal function of administering the health laws and regulations of the State, the counties, and the incorporated cities and towns.

3. She has confided to the organised profession the right of naming all medical health officials—State, county, and city—and by doing so has not only placed the selection of these officials in the hands of those most competent to judge as to their fitness, but has thereby widely divorced her public health system from politics and from commercial influence.

4. She has provided her medical men, not only with the privilege, but with the right of practically applying through their organised bodies, State and county, whatever sanitary knowledge they may acquire to the prevention of disease and to the protection of the health and lives of the people.

"It is hoped that every member of the profession in the State will avail himself of the opportunity which this pamphlet affords of getting full information as to the medical laws of the State. When that has been done, the close coördination between the scheme of organisation of the profession and the public health system and laws of the State will be obvious. Then every member of the profession in the State will know his duty, and knowing, should stand ready to discharge it faithfully and conscientiously."

That the control of the Medical Association over the administration is complete is illustrated in the case of county medical officers of health:—

"No county health officer-elect shall assume office until his election shall have been approved by the State Committee of Public Health."

The Medical Association, as is indicated in the quotation above, has power of issue of certificates to practise medicine—i.e., it is not only a registration body but an examining and qualifying body.

"The Board of Censors of the Medical Association of the State of Alabama is constituted a State Board of Medical Examiners."

One passage in the "Law Regulating the Practice of Medicine" reads as follows:—

"The State Board of Medical Examiners may revoke a physician's certificate of qualification to practise medicine for any of the following: . . . (3) Being guilty of unprofessional conduct of a character likely to deceive, defraud or injure the public in matters pertaining to health."

As might be expected under the circumstances the law preventing the treatment of diseases of human beings by any system of treatment whatsoever by any person who has not obtained a certificate of qualification from the State Board of Medical Examiners is very precise and very rigid. On the other hand, it has been thought wise by the legislature to create special administrative bodies—e.g., the Alabama Tuberculosis Commission, the Child Welfare Department, independent of the State Board of Health

* Part I. appeared in THE LANCET of July 11th, and Parts III. and IV. will be given in subsequent issues.

and with separate statutory powers, while the regulation of the employment of minors in industry is confided to the State prison inspector.

While the purpose and the intention of this legislation appear to have arisen from an early realisation of the proper place of the medical practitioner in the public health machine, yet, in my opinion, the results obtained by this procedure have not been such as to justify the substitution for the recognised democratic manner of Government control of a system in which Government delegates its functions and its authority to a private organisation. Moreover, in practical working, many minor departures from the original idea have been introduced, until now the system actually in operation does not in practical detail differ much from the ordinary working of a Government department.

Dr. Chapin, the veteran Health Commissioner of Providence, comments thus on this method:—

"One plan to avoid political entanglements, which has been tried in several States, is to give the medical societies a share in the management of the health department. It is dangerous and unwise to give to non-representative bodies a share in the Government. Moreover, medical men as a body are not skilled in preventive medicine. Only great benefits, not to be otherwise secured, would warrant such a delegation of authority. It must be remembered that medical politics and medical log-rolling are at times as pernicious as any other form of partisanship."

The American Medical Association has fully acknowledged as its duty the encouragement of public health ideals amongst its members, and the dissemination of important information not only to its members but to the general public. Dr. Frederick Green, the secretary of the Council on Health and Public Instruction of the American Medical Association, laid down the position in 1914 as follows:—

"There is to-day serious need of an increased appreciation of the social responsibilities of the medical profession. As these are largely responsibilities of physicians in the aggregate rather than as individuals, it is important that they should be discussed in medical organisations and should become the basis of intelligent action. . . . Since the relation of physicians to the public cannot be that of dictators or rulers, and since the power for restriction and regulation must always lie in the will of the majority, there remains only a single relation which physicians as a class can maintain towards the general public—namely, that of teachers."

These are extracts only from an informative article, but they serve to indicate the basis of the present policy of the American Medical Association—viz., a collective rather than an individual responsibility, and an educational rather than a political policy. In the interpretation of these ideas the American Medical Association has rendered most important service—e.g., in the exposure of pseudo-therapeutic frauds, of quasi-medical impostures, the publication of much public health literature in the form of reprints and pamphlets, and most recently the publication of a popular journal, *Hygeia*, of a high order of excellence.

Australia.

In Australia there has been an interesting series of steps towards the realisation of the ideal inclusion of the general practitioner as a working organic element in the public health system. At the time of the influenza pandemic the Commonwealth Health Department summoned a conference of representatives of the State Departments of Health and representatives of the State branches of the British Medical Association. This was a new departure from established practice, as these conferences had previously consisted of officials only. In 1921, when plague appeared in Brisbane, this precedent was followed and a similar conference summoned. In 1922, at a conference on venereal disease control, the same constitution was adopted. In this way the importance of the practising profession in all public health matters was acknowledged and has been definitely established.

When, in 1921, the Commonwealth Department of Health was created, it was considered important

to maintain regular contact with the organised profession, and the suggestion was made that the Commonwealth Director-General of Health might attend and an unofficial talk might be held with the Federal Committee of the branches of the British Medical Association in Australia on the occasion of each of its meetings, held every six months. These talks, informal and perhaps inconclusive, have continued until now; and, while there is little to show of a tangible kind, there is much to cause satisfaction in two directions. The much closer association developing between the official departments and the controlling body of the medical profession offers promise of a practical expression to the acknowledged community of interest. In addition, there has been close consideration by the profession of the individual responsibility and opportunity of training physicians in matters of public health administration and possible reform; as a result the following has been adopted by the Federal Committee of the British Medical Association in Australia for the consideration of the whole profession:—

"In no State is the service of the practising practitioner officially utilised for the prevention of diseases to any degree consistent with his knowledge and opportunity. Any scheme to rectify existing conditions (in respect of public health generally) must have as its immediate ideal . . . the linking up of the general practitioner into active participation in the administrative scheme and the steady inculcation of the ideal of prevention rather than of carrying out regulations, into both the actively administrative and actively practising members of the profession. On the medical side the unit is the medical practitioner, whether in general or special practice or acting as medical officer to industrial or school organisations or to institutions. In addition to the treatment of his patients he should—

"(i) Notify to his district health officer on prescribed forms: (a) All birth, stillbirths, and miscarriages. Objection has been taken to this suggestion on the grounds that it would be impossible to secure notification of miscarriages in single women. The force of this objection is recognised. If it is so strong that notification of miscarriages would be a dead letter, it had better be dropped. On the other hand, it must be recognised that the notification proposed is to a medical not lay authority and that if the medical profession is to take its share in the lessening of criminal abortion, some such step will ultimately be necessary. Confidential notification of miscarriages by married women would frequently lead to the institution of treatment for otherwise overlooked maternal syphilis. Notification of stillbirths to the district medical officer would have the same effect. Notification of births to such authority would be of great value statistically and would assist in infant welfare objects. (b) All deaths. At present the death certificate is given to the relatives or undertaker and is largely formal. This practice would continue for burial purposes, but in addition a confidential notification to be made to the medical officer, as is at present done in Switzerland, could often show the relation of the cause of death to a previous infection in a way that is impossible now. This would afford more accurate statistical information and would make available a mass of information that is at present unutilised for public health purposes. The need is so greatly felt that some States already have a private arrangement between the principal medical officer of the State and the registrar of deaths, by which the latter forwards to the former copies of certificates relating to deaths from infectious causes. The present suggestion would gain the same object in a much more direct and far-reaching way. (c) All cases of communicable disease prescribed by the regulations. (d) All cases of mineral (lead, &c.) or organic (alcohol, &c.) poisoning.

"(ii) Order in writing prescribed methods of concurrent and terminal disinfection in infectious cases. The methods would be prescribed by the State health authorities (with the conference of State health authorities suggested later in the scheme these would soon become uniform in different States). The prescribed methods would be printed on different forms for different diseases. The practitioner would only need to sign one of these and hand to householder just as quarantine officers in different ports now hand fumigation orders to captains of vessels which require fumigation.

"(iii) Carry out the prescribed methods for the prevention of the spread of infection by contacts or carriers—i.e., throat swabs, collection of urinary and faecal specimens, &c. At present some of these are done by nursing or sanitary inspectors. It would be far quicker and more efficient for them to be done by the practitioner seeing and treating the case.

"(iv) Examine school-children in particular districts by arrangement with the district health officer and education authorities. Such a provision would chiefly apply to country schools and might occur with regard to a particular threatened epidemic or with regard to physical examination of school. It would afford opportunity of co-operation of educational and health authorities in special cases.

"(v) Carry out other health duties as prescribed from time to time by regulations or as requested by district health officer. The objection has been raised that such a proposal puts the practitioner too much under the control of the district health officer. It must be remembered that in the discussion of a general scheme, some such clause must be inserted, to leave room for possible developments beyond the instances above cited. The term 'requested' as opposed to 'prescribed' is used to emphasise the fact that mutual co-operation between district health officer and practitioner is requisite to the scheme, rather than the purely formal carrying out of legal enactments.

"*Note.*—For all such services rendered the practitioner will receive fees prescribed by regulation. There would thus be an incentive to him to increase his activities; the more interest he showed in preventive measures, the more his remuneration; part-time medical officers would be abolished; all men in practice would be on the same level in relation to departmental administration."

If this proposal be adopted it will be a new move in public health progress. The enrolment of the private practitioner in the public health army is by no means a new idea, but the idea of making him the medical officer of health to his own patients will be a new move even if it is not a new idea.

Qualifications to these Proposals.

The present writer, giving evidence before the Royal Commission on National Health Insurance, after dealing with the above proposals, made the following qualifications:—

"All experience shows that modern preventive medicine is ignoring the general medical practitioner to its own disadvantage, and that it is now essential for the success of preventive medicine that all practising physicians should become actively engaged in the official campaign against the occurrence of disease and death. It is, however, necessary that: (1) The practitioner shall not be expected to undertake any duties which are not on the lines of his daily medical work; (2) the practitioner shall be adequately paid for all work done; (3) the practitioner shall be prepared to accept freely both advice and direction from trained public health officials on matters outside the range of his own experience or within the range of official necessities; (4) the practitioner should be prepared to accept discipline in professional matters relating to public health from an official body of his professional colleagues in place of the police court discipline now provided by various statutes.

"There is one phase of the relationship between the medical practitioner and any administrative organisation which requires consideration. It is an important item in the unwritten code of medical etiquette that a diagnosis declared to a patient by the doctor shall not be questioned in the presence of the patient and shall not be lightly altered even by a senior consultant. While the presumption of infallibility may in the past have been an important adjunct to the doctor's treatment, the general state of public enlightenment renders this now unnecessary and the attitude of the profession in relation to the sanctity of the original diagnosis as a matter of ethics might well be revised. Another related matter is the practice of some doctors of giving the patient a wide margin of benefit in the issuing of medical certificates for official purposes. It is very desirable that medical certificates of sickness or disability should be more reliable than they now are in many cases."

Here, then, on the one hand, is the idea, already widely accepted and frequently reiterated—the correlation of the medical practitioner with public health administration. On the other hand are three different types of practical expression of this idea. In Alabama the whole responsibility for public health administration was originally entrusted to the organised profession. The American Medical Association is doing much in developing a policy of intelligent collective action in public health work, but has not taken, as an association, any defined place in the public health scheme. The Federal Committee of the British Medical Association in Australia is working towards the objective of making the whole army of medical men in the country the

fighting force in the public health campaign. This will have—if successful—several good results. It will increase the interest of every medical practitioner in the prevention of disease; it will compel the public health specialist to supply reliable information which means that he must know his subject thoroughly; it will give to the departmental authorities a solid backing of support which will enable them in their turn to compel attention, respect and, most important, funds, from Parliament and Government.

The administrative interpretation of the principles of public health in practical form as one of the functions of Government can hardly be considered a legitimate field for the organised association of the practising profession or even for its members individually. The devotion of part of the resources of the collective profession to the education of doctors and public in the principles and technique of public health is a legitimate and most valuable form of auxiliary enterprise, but it does not utilise to the full the great potential striking value of the medical army. This can only be achieved by enlisting that army as voluntary members and training them to coherent action with uniform and intelligent inspiration—the training, inspiration, and direction being supplied by a headquarters staff of trained specialists in which the whole army has full confidence.

Whether any one of these modes, or something quite different, is ultimately found to be the best, all are agreed with Sir George Newman that "an adequate medical service must seek to fulfil and conjoin all the varied elements of a national health policy, environmental and personal. There must be no divorce between the epidemiologist and the practitioner."

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the health statistics for 1924 of a group, including four metropolitan boroughs and the county borough of West Ham:—

Name of borough.	Mid-year population (R.G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.	
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.
Kensington ..	178,700	16.2	13.0	0.83	1.6	3.2	25	75
Poplar ..	167,300	22.9	12.1	1.20	1.3	3.5	27	72
Westminster ..	139,900	11.6	11.8	0.99	1.5	3.0	27	59
Stoke Newington	52,920	16.6	11.3	0.85	1.4	2.2	27	58
West Ham ..	317,400	22.7	11.5	1.19	1.3	3.2	—	78

Kensington.

Dr. James Fenton reports several "bests on record" for 1924. These include the death-rate from tuberculosis, the infant death-rate from enteritis, the maternal mortality-rate, and the death-rate among illegitimate infants. The majority of the inhabitants of North Kensington are poor people, whilst in South Kensington such persons constitute only a small portion of the population. This fact is reflected in the birth-rate of 21.7 for North Kensington and 9.2 for South Kensington. During the year the council took successful proceedings against a medical practitioner for failing to notify a birth.

One of the most difficult of the housing problems in Kensington is the sanitary control of houses let in lodgings. There are 5690 tenement houses—i.e.,

houses let to more than one family without being specially adapted for the purpose. Of these 2904 are on the register of houses let in lodgings. About 55,000 persons occupy these houses. Worse than these are the houses let in so-called furnished rooms, and Dr. Fenton records with satisfaction the gradual diminution of these latter. Thus, in 1912, there were 187, and at the end of 1924 there were 83. A table is given in which the infant mortality-rates in the tenement houses and mews dwellings are compared. There are 2091 mews dwellings in the borough. The annual figures are small and have to be used with caution. The infant mortality in private houses was 43 in North Kensington, 61 in South Kensington. The infant mortality in tenement houses was 90 in North Kensington, 47 in South Kensington. The infant mortality in mews dwellings was 72 in North Kensington, 41 in South Kensington. During the last three years there has not been a single death from enteritis in the South Kensington mews dwellings, the majority of which are over garages instead of stables. During 1924 there were also no infant deaths from enteritis in North Kensington mews dwellings, in the case of which only a few of the stables have been converted into garages. The good results as regards enteritis in 1924 are attributed by Dr. Fenton mainly to the cold and rainy summer. Before any conclusions are arrived at as to the effect of housing conditions upon infant mortality, "consideration," says Dr. Fenton, "must be given to the fact that negligent, careless, ignorant, and poverty-stricken parents generally drift into the worst type of tenement house and mews dwelling." Infants in the better-class homes are not visited by the health visitors. During 1924 these "above-standard" births number 768, with 19 deaths, giving an infant mortality of 24. This is to be compared with an infant mortality of 93 for the remaining infants.

A table shows that the decline in the mortality of illegitimate infants has been very marked in recent years. Thus, during the period 1911 to 1921, the infant mortality of illegitimate children was much more than double that of the legitimate, while in 1922, 1923, and 1924 the rate for illegitimate children was 135, 127, and 97 respectively, as compared with 82, 70, and 75 for all infants. Antenatal work continues to make progress. Thus, for 2140 births coming within the scope of the council's scheme, there were 1199 expectant mothers who attended the antenatal clinics of the Queen Charlotte's Nurses' Home and the infant welfare centres.

Poplar.

Dr. F. W. Alexander's thirty-second annual report includes those of the chief health visitor, the senior medical officer of the Royal College of St. Catherine (Dr. H. K. Waller), and the council's dental surgeon. Artificial sunlight has been administered to a number of children and the results are so encouraging that permanent accommodation is being obtained for its much more extensive use. A permanent building is also to be erected for the installation of extended plant for the manufacture of electrolytic disinfectant fluid. There is an increasing demand for this disinfectant, and it is in regular use for the three swimming-baths. The arrangements with the Seamen's Hospital, Greenwich, for carrying out bacteriological examinations (other than tubercle) continues to be satisfactory. Plans are being prepared for an up-to-date maternity and child welfare clinic in High-street, Poplar, and also for the erection of observation wards. Provision will be made for a dental clinic and for artificial light treatment.

Dr. W. C. P. Smith, the tuberculosis officer, reports that the new premises for the dispensary, Wellington-road, Bow, have now been in use for a full year and that they have given every satisfaction. The comparatively quiet surroundings are much appreciated after the turmoil of the main road. The question of a branch dispensary in High-street, Poplar, is still under consideration. Cases of lupus are given Finsen light treatment at the London Hospital. The council pays

a charge of 5s. per application. Seventeen cases received 440 applications during the year.

Dr. Waller, in his report, gives an account of a case which illustrates some of the disadvantages of institutional treatment of an infant suffering from malnutrition. The history of the baby was something as follows. It was born in a lying-in hospital and its weight was inaccurately registered at 9 lb. As it only weighed 7 lb. 10 oz. on the seventh day it was taken to the out-patient department of a children's hospital at a distance and breast-feeding was replaced by artificial feeding. It did not thrive, however, and was admitted into a Poor-law hospital on the fifteenth week where it improved rapidly up to the twenty-second week. For the next seven weeks it lost weight as an in-patient of a convalescent home. For the next five weeks its weight remained stationary at a resident children's nursery. At 35 weeks it was brought to the centre and weighed 11 lb. Its dieting and management with the help of the health visitor was found to be a simple matter. The visitor encouraged the distracted mother. The improvement was uninterrupted, and at 52 weeks the baby's weight was 20 lb. Dr. Waller emphasises the need for accurate weighing at birth and the importance of the health visitor's work in the home.

Westminster.

Dr. Francis J. Allan, in his farewell report, gives an interesting contrast of conditions and death-rates in the city of Westminster when it was re-incorporated 25 years ago and at the present time. At the former period the large slum areas north of the Strand with a density in parts of 900 to 1200 persons per acre was being dealt with. Underground habitations were common. The law is now more stringent and in 1924 only seven instances of infringement were discovered. In the earlier period the water-supply of houses was restricted and seldom carried above the ground floor. The abolition of the system of an extra charge for water laid on to upper floors helped matters. Now every tenement house has water on each floor. Refuse was only collected weekly or fortnightly, and this with the restricted water-supply inevitably led to a high infant mortality from diarrhoea. In 1903 the Westminster Health Society was inaugurated and has been active ever since. Needless to say, there have been great improvements in the death-rates. The male death-rate from all causes has declined from 16.5 in the first quinquennium of the century to 14.4 in 1921-24; the female from 12.5 to 9.6; and the infant mortality from the neighbourhood of 120 to an average of slightly over 50 for the last three years. The death-rate among children between the ages of 1 and 5 has been halved, while the death-rate among children from 5 to 15, always low, has remained practically constant throughout the whole period. There is little change in the death-rate of infants in the first week of life, but a marked improvement in the neonatal mortality. Amongst other matters mentioned by Dr. Allan is the improvement in the tailoring and dressmaking workshops in the northern areas. Better ventilation has been secured and the Gas Light and Coke Company have co-operated in providing proper methods for carrying off fumes.

Stoke Newington.

Dr. Henry Kenwood would like to see provision made for dental treatment in connexion with the maternity and child welfare scheme. Owing to the risk from small-pox two small shelter flats have been provided for the temporary accommodation of families during the disinfection of their houses. There appears to be a prejudice on the part of the public against occupying these shelters unless the circumstances indicate grave danger. Dr. Kenwood evidently thinks they might be used with advantage in cases other than small-pox. The tuberculosis officer (Dr. L. U. Young) says there is no apparent improvement in the housing conditions of the area served by the dispensary. General practitioners are sending up new cases to the dispensary in increasing numbers.

The children attending Stormont House School have responded well to open-air treatment. The Invalid Children's Aid Association have been instrumental in obtaining accommodation at convalescent homes for delicate and tuberculous children, but the need for a local home for advanced and urgent cases of tuberculosis still exists. Dr. Sophia Jackson-Smith (maternity and child welfare officer) says very few babies suffer from malnutrition but a large number from overfeeding and too frequent feeding. Education in food values is needed, she says, and the older girls should be taught cookery in a practical manner. Very few parents are unable to provide suitable clothing, but nevertheless many children suffer from unsuitable clothes. The toddlers do not get enough sleep. Antenatal work makes progress. Two women gave birth for the first time to living babies, one after three and the other after four stillbirths. More houses are needed, not on account of the industrial development of Stoke Newington, but to cope with overcrowding. Dr. Kenwood complains of the failure of the scavengers to keep the refuse carts covered with the tarpaulins provided for the purpose.

West Ham.

Dr. F. G. Collins only took up his duties last September. Thirty-one cases of encephalitis lethargica were notified, in three of which the diagnosis was not confirmed. One death of an infant girl occurred; eight of the 28 cases appear to have made a complete recovery. The remainder are under treatment suffering from various nervous symptoms and debility. As the introduction to a propaganda campaign, a Christmas card from the West Ham Council was distributed to each of the scholars in the elementary schools with the headline "Health is better than Wealth," and nine health maxims inside.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 11TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 88; scarlet fever, 1635; diphtheria 896; enteric fever, 49; pneumonia, 775; puerperal fever, 61; cerebro-spinal fever, 11; acute poliomyelitis, 8; encephalitis lethargica, 52; dysentery, 4; ophthalmia neonatorum, 133. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 2 deaths from enteric fever, 35 from measles, 63 from whooping-cough, 9 from scarlet fever, 25 from diphtheria, and 13 from influenza. In London itself there were no deaths from influenza; deaths from diphtheria numbered 7, from whooping-cough 15.

NO TAX ON TOURISTS IN FRANCE.—The French Parliament has fixed at 68 francs (10 francs for students and workers) the cost of the identity card which must be obtained by foreigners staying in France for a period exceeding two months. The card once obtained will be valid for two years. The Office National du Tourisme may take some credit for the preferential treatment thus accorded to bona-fide tourists.

ASSOCIATION STOMATOLOGIQUE INTERNATIONALE.

At a meeting to be held at 11, Chandos-street, London, W., on Monday, July 27th, at 8.30 P.M., the following societies will be represented: Royal Society of Medicine, Section of Odontology; British Dental Association; Public Dental Service Association; and the Incorporated Dental Society. The chair will be taken by Mr. A. Templar Barritt, L.D.S., dental surgeon to the French Hospital. After an address of welcome by Sir W. Arbuthnot Lane, papers will be read on the following subjects: Public Dental Service in England, by Mr. J. Clifford Wing, L.D.S. Professional Education of Medical Specialists in the British Isles (Stomatologists and Dentists), by Mr. J. Lewin Payne, M.R.C.S., L.D.S. Stomatology, Public Health, and the Qualifications for Specialists in Medicine in 1925 in Relation to International Social Problems, by Mr. Alfred J. Asgis, D.D.S., clinical professor of stomatology, New York Polyclinic Medical School. National Health Insurance (Dental Phase), by Mr. Fred. Butterfield, secretary of the Incorporated Dental Society and member of the Dental Board of the United Kingdom. The President of this Association is Dr. Chompret at 182 rue de Rivoli, Paris.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

THE ninety-third annual meeting of the British Medical Association opened at Bath on July 17th, when the Representative Body met at 10 A.M. in the Grand Concert Hall of the Pump Room. Dr. H. B. Brackenbury occupied the chair.

Municipal Welcome.

During the course of the morning the Mayor of Bath, Alderman Cedric Chivers, J.P., visited the meeting to convey a welcome to the Association. He said that this gathering was, perhaps, the most important and certainly the largest company that had ever honoured the city with its presence; the bells of the Abbey had been rung in welcome, and he was glad to have an opportunity to recognise publicly the great service and vital value of the medical profession to civilisation. There was no need to extol the beauties of the city and locality; his task was to offer the fullest hospitality to the meeting, an offer bounded only by the space and material at the disposal of the municipal authorities. Dr. Brackenbury, in reply, said that the Association had looked forward for years with peculiar pleasure to this visit to a historic and beautiful city renowned for those principles of health and education for which the medical profession stood.

REPRESENTATIVE MEETING.

FRIDAY, JULY 17TH.

After the usual formal business the meeting passed a vote of deep regret and condolence with the President, Dr. F. G. Thomson, who was prevented by illness from taking his place at the gatherings. Mr. C. P. Childe was elected a vice-president of the Association, in recognition of his services as President 1923-24, and Mr. R. G. Hogarth of Nottingham was elected President for 1926-27. In 1927, the year of the Lister Centenary, the Association will meet in Edinburgh. Mr. F. G. Hallett was elected an honorary member in gratitude for his valuable services, particularly in connexion with the preparation of the Roll of Honour. The affiliation with the Canadian Medical Association was celebrated by the election of two of the Canadian delegates as Vice-Presidents: Dr. A. Primrose, Dean of the Medical Faculty in Toronto and chairman of Council, C.M.A., and Dr. F. N. G. Starr, honorary secretary of the Annual Meeting, 1906. At an extraordinary general meeting held in the afternoon the articles of the Association were duly amended to allow of the affiliation.

In moving the adoption of the annual report of Council, Dr. R. A. Bolam referred to the serious losses in personnel suffered by the Association during the year, particularly that of Dr. Haslip, the ex-treasurer, the fruit of whose wise judgment they continued to reap. He referred to the new "Sir Charles Hastings Fund," established through the generosity of a member of Council to form a reservoir from which urgent needs experienced by members of the Association might be relieved without undue formality.

The New House.

In approving the report of Council under the heading "New House of the Association," the Chairman referred to the award of the gold medal of the Association to Dr. Bolam, who responded to prolonged applause by expressing his deep appreciation of the honour done to him and his vision of the new house as rallying point for members in the Kingdom and the Empire, and a focus of activity which should be of the greatest value to the profession and the State. He urged those to come not to be afraid of undertaking heavy responsibilities and carrying out the larger plans for the headquarters, but to look with a generous eye to the future.

The Representative Body then placed on record its deep appreciation of the services rendered in connexion

with the selection, preparation, and opening of the new house in Tavistock-square. The resolution is to be framed and hung in a suitable place within the house.

Dr. Bolam, in acknowledging these motions and the congratulatory speeches of Sir Jenner Verrall and Dr. J. A. Macdonald, said that it was largely a question of time and place and circumstance that any one man should be on the spot and be able to do the service necessary. He paid a tribute to the special and well-nigh indispensable qualities and knowledge of the financial secretary, Mr. L. Ferris Scott. It had been astounding and most gratifying to see the devotion of all officials, senior and junior, to the work of the Association during the trying period of stress, and the Association might well feel proud of the spirit animating all its workers.

Financial Position.

Mr. N. Bishop Harman, the treasurer, in moving the adoption of the financial report, pointed out that there was a surplus of over £8000 obtained on a record expenditure of £113,917. The forecast for the year 1924, published in the annual report of Council for 1923-24, showed an estimated surplus for the year of £5500; the actual surplus realised as shown by the books was £8923, a result accounted for almost equally by increases over the estimates in the revenues from subscriptions and advertisements.

A New Journal of Paediatrics.

Dr. J. A. Macdonald, chairman of the Journal Committee, reported a very successful year, and announced that the Committee proposed to found a subsidiary journal of children's diseases to publish certain articles on this subject that were not suitable for the general paper, but could find no adequate place in any existing journal. It was hoped that the publication, a monthly one, would be self-supporting, and the principle might subsequently be extended.

Research Scholars.

Dr. C. O. Hawthorne, in submitting the report of the Science Committee, said that the Association might well congratulate itself on the work accomplished by its scholars. In particular the holder of the Ernest Hart Memorial Scholarship, Dr. A. J. Copeland, had succeeded in finding a new local anaesthetic with all the virtues and none of the perils of cocaine. The Committee was much indebted to the specialists who inspected the work of these scholars, and reported on them, and also to those who acted as judges in the award of prizes. The library was being increasingly used by members.

Mr. H. S. Souttar added his congratulations on the work of the research scholars, and pointed out that one of them, Dr. H. W. Cairns, had obtained a Hunterian professorship at the Royal College of Surgeons of England as a result of his work whilst holding a B.M.A. grant.

Mr. E. B. Turner said that the grant allowed for scientific work was much too small.

Standards of Remuneration for Teachers and Research Workers.

Dr. Hawthorne mentioned two projects not yet ready for discussion by the Representative Body, viz. :—

1. The establishment of a standard of remuneration for laboratory and research workers to the effect: Proposed that whole-time (a) non-professional medical teachers, and (b) medically qualified laboratory or research workers, should be grouped into three grades as defined below, and with the salaries as stated :—

Grade III.—Comprising those who are junior workers temporarily employed on probation; no person shall remain in Grade III. for more than three years. That the minimum salaries for Grade III. shall be as follows: First year, £300; second year, £350; third year, £500.

Grade II.—Comprising laboratory or research workers or teachers who have had experience in Grade III. or in work of a similar character, and who are permanently and exclusively employed as such.

Grade I.—Comprising those of Grade II. whose qualifications or duties justify a position of seniority in status and a higher remuneration. That the minimum salary for Grade I. shall be £750 per annum; that after the probationary period (i.e., Grade III.) has been completed, dismissal should be possible only on grounds of neglect of duty, improper conduct, or incapacity.

Proposed that non-professorial medical teachers and medically qualified laboratory or research workers holding part-time appointments should receive remuneration, for the time engaged, at the rate of not less than £600 per annum.

A Book of Remedies.

2. The publication of a book describing the nature and quality of new and non-official medicines, similar to that published by the American Medical Association. The object which the A.M.A. has in view in publishing its book is to disseminate information among members of the profession in the United States relative to new and non-official medicines and medicinal preparations. For admission to the book any one of these must comply with the rules of the A.M.A. which prescribe, inter alia (i.) that the composition of all articles must be declared; (ii.) that generally speaking articles advertised to the public will not be accepted; and (iii.) that an article will not be accepted concerning which the manufacturer makes unwarranted, exaggerated, or misleading statements. The Council understands that the activities of the A.M.A. in this direction meet a real need on the part of the profession in the United States.

These proposals will come before the Representative Body next year. Dr. Hawthorne urged members to consider whether such a publication were necessary or advisable, if so, whether it were a suitable activity for the Association and whether it were a justifiable expenditure.

Oblique Advertising.

The chairman of the Ethical Committee, Dr. R. Langdon Down, presented the reconsidered recommendations as to oblique advertising which the Committee hoped would provide a compromise satisfactory to the press and the profession. The report recommends that practitioners who desire to discuss in the lay papers matters relating both to medical science and policy and to the health and welfare of the public should make it a condition of publication that laudatory editorial comments or headlines relating either to the contributor's professional status or experience shall not be permitted; that his address or photograph shall not be published; and that there shall be no unnecessary display of his medical qualifications and appointments. There is a special claim that practitioners of established position and authority shall observe these conditions, for their example must necessarily influence the action of their less recognised colleagues. Discussions in the lay press on disputed points of pathology or treatment should be avoided by practitioners; such issues find their appropriate opportunity in the professional societies and the medical journals. The report goes on to say :—

"After making all allowances for all those modes of publicity for which there may be some justification, there remain many instances which can only be regarded as gravely and unnecessarily contravening the spirit of the notice of the G.M.C. The Association is convinced that in taking up an attitude of determined opposition to these undesirable journalistic methods the Association is acting in the best interests of the public as well as of the medical profession. The extension of the system can only lead to a competition for public notice in which the more scrupulous men would be left behind, to the detriment of the public who are ill-qualified to judge of the true worth of scientific opinions. The extension of the advertising habit among the profession in general would certainly destroy those traditions of dignity and self-respect which have helped to give the British medical profession its present high status, and would gravely undermine the amenities and harmonious working of medical practice. The Association, therefore, draws the attention of the profession to the danger of these objectionable methods, and insists upon the urgent need that every member of the profession who values its honour should offer a firm resistance to them. If only those whose reputation is mainly derived from newspapers allow their names and opinions to be quoted or to appear as those of 'the

eminent' physician, surgeon, or specialist, the practice will die a natural death."

Locum-Tenents.

The following motion governing the conduct of a practitioner desiring to set up practice in the area in which he had acted as a locum-tenent was carried without discussion:—

That as a locum-tenent is introduced in confidence to the practice of which he takes charge, it must be presumed on principles of common equity that he cannot without dishonour commence practice in the neighbourhood where he has acted unless with a written consent obtained either from the practitioner whose substitute he has been or from the legal representatives of this practitioner. There may, however, be circumstances, for example of lapse of time, which would make the strict application of this rule an unreasonable interference with the freedom of the practitioner who had acted as a locum-tenent. If any such plea for the relaxation of the rule in any individual case can be advanced the facts should be stated to the Central Ethical Committee, and the judgment of the Central Ethical Committee on the point should be accepted as final.

Blacklegging.

A discussion followed on a motion brought forward by Dr. M. W. Renton, on behalf of the Dartford division, arising out of certain practical difficulties experienced by the Kent branch, which were explained to the meeting by the branch secretary, Dr. E. A. Starling. The present regulation allowed a practitioner to apply for a post at a salary below the B.M.A. scale in spite of protests, to secure the appointment, and then to negotiate with his employers so that the salary was brought up to the minimum by means of addition or emolument. He would then be restored to his position in the profession, to the chagrin of loyal members who had withdrawn their applications. Dr. Langdon Down expressed his sympathy with the aim of the Kent branch, but did not consider it necessary to alter the ethical rules to attain that end. Rule V. was intended to apply to established posts already held, in order to give their occupiers an alternative to resignation. Any individual applying for a new post advertised at an inadequate salary should be dealt with under Rule VI. as a recalcitrant member. The Association had been passing through a transition period in the matter of salaries, and no final decision had yet been reached. Both he and the solicitor, Mr. W. E. Hempson, urged the meeting not to throw the ethical rules again into the melting-pot, nor to make an alteration without considering very carefully where it might lead. The motion was lost.

Alleged Abuses of Psycho-analysis.

Dr. A. Lyndon (Hindhead) formally proposed a motion:—

That the Representative Body instruct the Council to consider certain practices alleged to be prevalent among some medical men practising psycho-analysis and to report.

Dr. J. A. Parry (Brighton), bringing forward examples of the practices referred to, said he wished it to be clearly understood that this was not an attack on psycho-analysis as such, but was the result of much careful consideration by the Sussex Branch Council for many months. Judges and journalists were discussing these things, and it behoved the medical profession to take some action lest it be forced on them from without. He asked for discreet investigation, not condemnation.

Dr. Langdon Down said that there were two ways in which a practitioner might be considered by others to fail in his practice. He might hold a judgment with which his fellows entirely disagreed, but this could only be made an offence if the whole question were considered and rules laid down as to what was right, or he might deliberately do things contrary to his judgment, which would be extremely hard to prove. The best means open to the profession for the propagation of truth were scientific meetings and the columns of the medical press. Where a medical practitioner committed an offence against the public the remedy lay in the hands of the offended party; it was no part of the profession's duty to act for him. The speaker

doubted whether the matter were worth putting to the Council.

Dr. Hawthorne agreed that it was a case for the police or the General Medical Council, rather than for the British Medical Association, which was not a legal judicial authority.

Dr. C. E. Douglas (Fife) said that this was an important and very serious allegation, far too important and difficult for the Representative Body to deal with. The Council could receive evidence for and against, and give a considered report.

Dr. Bolam said that there might well be matters for the police or the General Medical Council in this investigation, and yet be a residuum that might be dealt with by the Association or by representations from the Association in other quarters. He suggested that the whole question should be referred to the Council for consideration; beyond that it would be hazardous to go.

Dr. Parry accepted this amendment.

Health Insurance Service.

The reports of the Non-Panel and National Health Insurance Acts Committees were considered and accepted.

Dr. H. G. Dain (Birmingham Central) referred to the work of the latter in preparing evidence for the Royal Commission, and in establishing a panel of some 500 ophthalmic surgeons willing to see insured patients under the new ophthalmic benefit scheme. During the year the public press had taken active notice of certain difficult cases in which the Ministry of Health had given judgment. The Committee had obtained remission of the unpaid part of the fine in one of these cases, and had laid down four definite principles which should hold in cases where the Minister had to give judgment. To these the Minister had agreed, only differing in some slight details as to their application. The Defence Trust Fund had increased to £73,000, and the Committee had decided that the interest from it should be used in defraying expenses. Before long they might be considering what amount could be considered a sufficient reserve; at present they hoped that all committees would continue their subscriptions.

Appeal to the High Court.

A considerable discussion followed on the motion of Dr. H. J. Milbank-Smith (Chichester, Worthing, and Horsham):—

That it be an instruction to the Council that when consulting the divisions as regards any suggested amendments of or additions to the policy of the Association in reference to the National Health Insurance Acts, or extensions of the same, they include for consideration the following proposal—namely, that, in addition to the right now enjoyed of appeal to the courts on the ground of improper procedure, appeal to the High Court shall be legitimate against any penalty, other than removal from the panel, imposed upon a practitioner by the Minister.

Dr. Milbank-Smith referred to recent cases in which the finding of the Minister had been contrary to that of a committee appointed to consider the case carefully. Much distress and anxiety had been caused to the profession by the lack of any possibility of appeal. An appeal in the Harnett case had completely reversed the situation and enormously strengthened the position of the profession. There might be a better relationship with the Ministry now, but ministers changed and there was no security that this would continue.

Dr. L. J. Picton (Chester, Crewe) said that N.H. Insurance had set up a new relationship between the practitioner and his patient, introducing a third party in the contract. The Common Law of the land should be the factor to adjust differences; the judges themselves did not think this would be unconstitutional. The patient could appeal to Common Law, and if a panel patient did so the Minister withheld his decision until the case had been tried; the doctor had no such right of appeal.

Dr. Dain reminded the meeting that a joint conference representing the whole profession had already agreed on this principle, and asked that cases involving

removal from the panel should be submitted to a purely medical tribunal, while cases involving a fine should have the right of appeal to the High Courts.

The motion was lost.

Disciplinary Action by the Minister of Health.

Dr. R. D. Mothersole (Bolton) proposed:—

(1) That the Representative Body strongly protests against the action of the Minister of Health in penalising Dr. X. for an alleged offence of which the Committee of Inquiry had declared that Dr. X. was not guilty, and that the charge ought not to have been brought; and (2) that the Minister of Health be invited to state what are the functions of a Committee of Inquiry, and how far its findings are binding on himself.

Dr. Dain said that representations had already been made to the Minister of Health on this matter, and he had agreed that judgment of proficiency must be a subject for the General Medical Council alone. The aim of this resolution had already been accomplished.

Some discussion followed, in which Dr. Brackenbury said it would be the opposite of serviceable to reiterate this protest, and Dr. Wallace Henry pointed out that to pass to the next business would look as if the meeting did not approve of the protest. The motion was eventually withdrawn in favour of the motion proposed by Dr. R. Wallace Henry (Leicester and Rutland), and seconded by Dr. J. F. Walker (South Essex):—

That this meeting approves the action of the Insurance Acts Committee in protesting in the case of Dr. X., and welcomes the declaration of the Minister of Health that he accepts the principle put forward by the deputation.

Royal Commission on Insurance.

Mr. E. B. Turner questioned the action of the Council in submitting the memorandum to the Royal Commission without bringing it before the Representative Body as such. He was extremely jealous for the democratic constitution of the Association and the rights of the Representative Body in which he had held every office from representative to chairman.

Dr. Bolam replied that the representatives had entered cheerfully into the method by which the Council had tried to obtain the opinion of the whole profession, and in his opinion it would have been very foolish to let the dry bones of the constitution over-ride the circumstances. The Association had repeatedly disregarded its standing orders in the effort to ensure that there should be no vestige of suspicion that it was trying to put forward anything in the name of the profession when outsiders had had no voice in it. The proceeding was eminently calculated to get the opinion of the whole profession as far as possible.

The Chairman pointed out that the evidence was not given as that of the Representative Body, but as that of the Council of the B.M.A. after certain procedures which were clearly set out. The present time was the correct occasion for the Representative Body to approve or censure the action of its Council.

No motion was put, but the applause that greeted Dr. Bolam's statement, showed that the meeting was satisfied that the method was a proper and constitutional way of dealing with the occasion.

Dividends on Panel Prescriptions.

Dr. C. J. Kirk (Darlington) then proposed:—

(1) That the action of the Coöperative Societies in allowing the prescriptions presented by patients under the National Health Insurance Acts, who are also members of the Coöperative Societies, to rank for dividend is entirely opposed to the spirit of the Acts. It is calculated to encourage malingering, to throw unnecessary work upon the practitioners administering the medical benefit, and to bring the work of the Insurance Acts into disrepute. (2) That the Council be instructed to press the Ministry of Health to remove this abuse of the provisions of the National Health Insurance Acts.

On the suggestion of Dr. Dain, it was resolved:—

That the motion be referred to the Council for investigation as to the extent of the practice.

Election of Council.

During the course of the day the unopposed return of the following 12 members to Council was announced:

Dr. G. B. Hillman, Dr. I. W. Johnson, Dr. J. W. Bone, Dr. T. Ridley Bailey, Mr. E. B. Turner, Dr. W. Paterson, Dr. C. E. S. Flemming, Dr. S. Morton Mackenzie, Dr. C. E. Douglas, Dr. J. G. McCutcheon, Dr. John Mills, and Dr. J. Singleton Darling.

SATURDAY, JULY 18TH.

Membership of the B.M.A.

In presenting the report of the Organisation Committee, Dr. S. Morton Mackenzie said that the membership now totalled 29,680, a figure 3000 higher than ever before. He did not believe that the increase was a "flash in the pan," but it could not be expected to continue at that rate. They were particularly anxious now to do more for the young practitioner. The establishment of a scale of remuneration had placed them in the position of asking these men to give up posts without offering any help.

Locum Bureaus.

One way of helping them was by the foundation of a locum bureau, which was a real need in the provinces. Already several such local bureaus were in existence, but at present their position was unregularised. Legally the Association could not undertake such an activity, but it was proposed to form a private limited liability company in which the A shares, conveying voting power, would be held by officials and officers of the B.M.A., and the annual meeting of the company would be held during the session of the Representative Body.

A number of members asked questions, and discussed the legality and details of the proposed scheme.

Mr. Bishop Harman urged the meeting to express its opinion on the general principle and leave the details to the Council, who might be trusted to take every legal and financial precaution. Delay was dangerous as such bureaus were constantly being formed, and the more there were the greater the difficulty of coördination.

After some discussion as to the advisability of giving preferential treatment to B.M.A. members, the principle was approved.

Individual Medical Defence.

Dr. Morton Mackenzie, introducing a resolution authorising the Council to prepare a draft scheme and ascertain the number of members who would join in it, said that the discussions at Portsmouth and Bradford had made the Committee realise that there was still a very considerable minority that desired the Association to undertake the legal defence of its members. The Committee had, therefore, persuaded the Council to allow a thorough investigation of the matter, financially and historically. The history of the question had been written by Miss Lawrence, the intelligence officer, and showed that the argument had been going on for 50 years, and that the Council had repeatedly allowed the matter to slide even when the Representative Body had passed resolutions in favour of it.

Dr. Mackenzie said he thought he could shorten discussion by laying down certain propositions. First, he thought they were all agreed that if there were no existing defence societies it was a work the Association ought to undertake; secondly, they were quite agreed that the Association could not legally undertake the work under its existing articles and memorandum; thirdly, at the moment any form of coöperation with the existing societies was quite out of the question. He had held the opinion that the true solution of the question was to do it in coöperation with the existing societies, but he was sorry to say that neither of these societies had seen their way to accept the overtures.

The possibilities before the Association were: (1) Full medical defence for all members, either in conjunction with or in opposition to the existing societies. This he thought was not possible because very many members were quite satisfied with the societies. (2) Optional full defence for those members who wished for it. (3) Partial medical defence—e.g.,

every legal help given up to the door of the court and then no more, or meeting those expenses which were not paid by existing societies. (4) The establishment of a legal bureau at the offices for advice and help. In his opinion (2) was the only solution; it would satisfy those members who were agitating for B.M.A. defence without upsetting those who preferred to remain as they were. The disadvantages were few; there would be no reserve fund at first, but the new company would have the backing of the Association, and the brains in the B.M.A. office were quite as competent to manage the affair as any in the existing societies. It would require 6500 members to make its inauguration a sound financial proposition.

A motion from Guildford impugning the Council for bringing up the subject after the Representative Body had voted against it was rejected, but a lengthy discussion followed the amendment by Cardiff:—

That as the matter of individual medical defence is being competently dealt with by various existing bodies, and as it does not appear that the Association could conduct medical defence in any cheaper or better manner, and as the provision of individual medical defence is not within the present powers of the Association, this meeting is of the opinion that the matter should be dropped, and that the expense of the proposed referendum of the profession be not incurred; but that the Association should bring to the notice of all practitioners, especially those recently qualified, the urgent necessity of joining one of the medical defence bodies.

Dr. Peter Macdonald (York) and others raised the question of indefensible conduct and the loss of prestige to the Association if it found itself compelled to defend such a case.

Mr. McAdam Eccles (London) and Dr. S. N. Scott (Plymouth) spoke of the difficulty of persuading men to join the Association when their immediate question as to the provision of defence had to be answered in the negative.

Several members, including Mr. E. B. Turner and Dr. J. C. Matthews, voiced the impracticability of the scheme. The financial position would be most insecure at first, the new company would be unable to meet a large case; it would be most unfortunate for the Association to have to defend a man brought before the General Medical Council, and all B.M.A. members would have to leave the Council while such a case was being tried.

Dr. D. Lawson urged that the cobbler should stick to his last; he was not so optimistic as to accept the estimate of the ability of the B.M.A. staff, and its funds had not been accumulated to squander on speculation.

Dr. J. Neal (Hendon) said that the requirements of the profession were already fully met, and this doubtful experiment offered no advantage to its members. He denied that the existing societies had ever been asked to coöperate; they had only been asked to grant financial concessions, at their own expense, to members of the B.M.A.

Dr. J. F. Walker (Essex) thought that this dangerous weapon would be looked upon as an attempt on the part of the B.M.A. to entrench themselves behind their prerogatives to the detriment of the public and might well prove to be another horse of Troy.

Other members, including Dr. C. Sanders and Dr. C. E. Douglas (Fife), pointed out that the resolution only asked the Council to obtain information and report in order to show what the demand was and how far it might be practicable. If the scheme came into being it would only be by the support of the younger men; the seniors were loyal to their own societies and were not going to let them down, but times were changing and young men were coming on; this might be the step of the future.

Dr. Christine Murrell (London) said that if the new company were to be closely associated with the B.M.A., the practical difficulties would be very great and might be disastrous; if it were to be but loosely connected it would be equivalent to setting up a third society for which there was no particular need. There was a definite advantage to the individual in being able to get the little difficulties of practice redressed

by a protection society without having to make it known to the professional and scientific association.

Dr. Dain believed that individual medical defence would mean loss of prestige; the Association had always maintained that anything it did must be in the interest of the public or else it could not be in the real interest of the profession. He thought the solution lay in real coöperation with the existing societies, which need not necessarily mean preferential treatment.

Dr. J. S. Manson (Warrington) suggested that the local division might decide whether any particular case should be taken up by the B.M.A. or not, but as Dr. Hawthorne and Dr. E. E. Brierley pointed out, this would place the divisions in an invidious position and might lead to conflict between the local and central authority.

Dr. E. R. Fothergill (Brighton) spoke of the difficulty of finding a suitable firm of solicitors, and said that the only real coöperation was for the B.M.A. to increase its subscription to £4 and offer to pay the subscription to any defence society the member chose.

Mr. Bishop Harman said that there was a growing involvement of medical defence with general propositions; it was no longer possible to leave defence of the individual to one society and of the profession to another. In the Harnett case the defence of the individuals had been the defence not only of the profession but of the public. Already the defence societies were giving advice on general medical matters. Coöperation was desirable, but coöperation could not be attained until the B.M.A. made up its mind what it was going to do. The future lay with those who had closest touch with the new practitioners. He begged the meeting to let the Council find out once and for all what was the volume of the demand which had so frequently made itself heard in the history of the Association.

The amendment by Cardiff was carried, on a roll-call vote of 97 to 72, and the principle of individual medical defence was thus again rejected.

Inquiries and Badges.

In moving the adoption of the Supplementary Report under Organisation, Dr. Morton Mackenzie said that the questions answered at the offices were increasing in multitude and variety; in addition to problems of practice and lodgings, they were asked how to open a banking account and how to get married, and, more particularly, about post-graduate work, which must clearly be the next activity of the Association. The overseas branches were in a satisfactory condition. New members of the Standing Committees were wanted. It was proposed that branch and division chairmen and secretaries should have a standard badge to enhance the dignity of their office.

Dr. C. G. H. Morse described a series of successful post-graduate courses in Bournemouth, and hoped the B.M.A. would not look on London as the only place for post-graduate work.

Dr. J. Stevens proposed that miniature badges should also be prepared, that ex-chairmen and secretaries might keep as permanent mementoes of their work.

Parliamentary Fund.

Dr. E. K. Le Fleming (Dorset and W. Hants) presented the report of the Parliamentary Committee and emphasised the fact that the Association had no political bias, but required that those who received its support should subscribe to the broad principles of policy laid down by the Representative Body. So long as the Labour Party had as a plank in its platform the State Medical Service and State aid for hospitals they could not assist its candidates. The position of the profession in Parliament was much more satisfactory than hitherto. The aim of the Committee was that the requirements of the profession should be clearly stated in the House, but the state of the Parliamentary Fund was still very unsatisfactory.

Investiture.

During the meeting the Chairman was invested with the new badge of office, bought in honour of the twenty-first meeting of the Representative Body, by Dr. W. Douglas, "the father of the Representative Body," supported by Dr. Milner Moore, a member of the Association since 1869.

(To be continued.)

CONVENTION OF ENGLISH-SPEAKING OPHTHALMOLOGICAL SOCIETIES.

LONDON, JULY 14TH-17TH.

(Continued from p. 150.)

ON the evening of Wednesday, July 15th, there was a very large gathering of members of the Convention to hear a symposium on the subject of the

EVOLUTION OF BINOCULAR VISION,

the chair being occupied by Mr. Treacher Collins, the President.

Prof. Elliot Smith said there were certain aspects of this problem upon which anatomists could throw a certain amount of light, or at least they could define certain issues which other speakers could more fully interpret. He considered that the problem of binocular vision was of the very essence of the question of human evolution, as the cultivation of vision and the increased reliance on it for guidance was the fundamental fact which brought about the evolution of the Primates and led to those distinctive qualities which differentiated man from other living creatures. Man's ancestors were certainly the first creatures to see the world in the sense properly understood. Such vision resulted in the ability to perform skilled movements and to acquire by experimentation a knowledge of the world and of the events taking place in it, the knowledge which placed man in his position of supremacy. Thus, the problem was not merely that of the functional association of the two eyes in vision, but a study of the factor which constituted the primary stimulus to the emergence of the distinctive qualities possessed by man. The student had first to try and trace what series of animals could throw light on this gradual development. Fortunately, in the case of the Primates there survived—in many cases from the Tertiary geologic period—a series of creatures which had escaped the devastating effects of extreme specialisation, and so enabled a study to be made of the phases through which man's ancestry passed. The Primates came into existence in North America, near Wyoming, before the beginning of the Tertiary period; there they separated from the group of insectivorous animals, which had been studied so well by Mr. Le Gros Clark in Borneo, who specially examined the structure of the eye and retinae, the cerebral cortex, and the oculo-motor nucleus. Shortly before the beginning of the Tertiary period the lemurs came into existence, and in one particular class smell began to be replaced by vision as a guiding sense. Primitive monkeys came into existence in the middle of the Eocene period, reaching Europe from South America, and they split up into tailed monkeys and the higher group of anthropoids. It was not until after that period that the giant anthropoids came into being. The nearest remains of the human family belonged to the Pleistocene period, but there still remained a gap which was unspanned. The most important class of animals for this study was the tarsus, as it had survived from the beginning of the Eocene period with practically no change. There was a shrinking and flattening of the nose to allow the eyes to come to the front of the face, so that the creature could look forward, and the visual fields overlapped almost as much as they did in the case of monkeys and in man. It was possible to demonstrate the fact that the *ora striata* reached its maximum size even in the most primitive monkeys, so that as the brain

was much smaller in them than in the higher Primates, the visual cortex in them was proportionately great. Using this method, the speaker was able some years ago to map out, without histological technique, the distribution of the cortical areas in the series of animals represented in a diagram he exhibited, commencing with the jumping shrew. The primitive animal was guided by its sense of smell, but in its arboreal cousin smell was reduced and place was given to areas for vision, hearing, touch, &c. It was the development of the visual cortex which led to the emergence of the tarsoids, and in these there was an enormous reduction in the cortical area assigned to the olfactory sense and an increase in that subserving sight. He made this inquiry 15 years ago, and since then Mr. Le Gros Clark had shown the same thing by histological methods. Comparing the tarsus with the marmoset, a profound transformation in the brain structure was noted. Not only was the brain of the latter much the bigger, but there was a great expansion of areas allocated to sight, hearing, touch, and the pre-frontal region generally. All this made for increased precision of movement, and especially of finer movements. Equally certainly a very profound accompaniment of delicate intensive manipulations was the acquisition and development of binocular vision.

A striking pre-binocular vision stage was illustrated in the case of the chameleon, for this animal could look forwards with one eye and backwards with the other, and it used its eyes for fixing an object in much the same way as it shot out its tongue to seize its prey. The actual fixing of an object by the eyes occupied some minutes, the concentration being, doubtless, on the muscular act rather than on the object seen. It was this linked separate movement of convergence which had developed in mammals. Dr. Wilfred Harris had shown that the optic tracts of all vertebrates other than mammals could cross, but a certain number of fibres remained uncrossed. In some animals there was a reduction in the size of the snout, which allowed the eyes to move forwards, a prior necessity before stereoscopic vision could be acquired. Mr. Le Gros Clark had examined the retinae of both living and dead tarsus, but was unable to find anything resembling a macula, either by ophthalmoscopic examination, by gross anatomy, or by histological methods. But though the eyes of tarsus looked forward and it had developed its *ora serrata* to a greater extent than had the lemur, and though its visual fields overlapped, it yet had not acquired full powers of stereoscopic vision, nor of guiding its hand movements as the monkey could, nor of carrying out a range of conjugate movements. There was evidence, however, that this animal felt the need of these accomplishments, and in obedience to that need it acquired the ability to so move its head that it could and did look backwards, as shown by an actual photograph. Research during 40 years had shown that it was the great pre-frontal area of the brain which was concerned with controlling these more complex conjugate movements which were distinctive of the apes and man. A true macula lutea was found only in the latter two species. In marsupials there was a small region in front of the motor area which controlled movements in only one eye. He showed slides of micro-photographs demonstrating that the eyes underwent transition from lemur to tarsus and then to monkey.

Sir Frederick Mott referred to the thesis he propounded in his Bowman lecture of 20 years ago, when he dealt with the evolution of binocular vision coincidentally with that of the visual cortex. The conclusions then expressed had been confirmed, and he had not had the opportunity of carrying his research further. He exhibited slides showing that the *lunate sulcus* seen in all anthropoids was sometimes to be observed in man also. With the rise in the animal scale the *peri-striate* area of the occipital lobe was found to be increased, and coincidentally there was a greater development of the frontal region of the brain. It had been found by Prof. Watson, of Baltimore, that

a baby could fix a light soon after birth, but not until the 130th day did it acquire associated hand movements. It was found that in the full-term foetus there was a myelination of the optic radiations, and hence it was argued that this region was instrumental in fixing the light. Sir Frederick Mott showed that all our visual experiences were associated with tactile perceptual ones, and exhibited a number of slides illustrative of the work which Prof. Sherrington and he did together. Closely associated with the area concerned with the conjugate movements of the eyes was that regulating movements of the eyelids. His conclusion was that the frontal region of the brain was that concerned with attention, and especially with that associated with binocular vision.

Prof. S. E. Whitnall (McGill) explained that his interest in this problem had been mainly with the movements of the eye muscles during the gradual transition of the eyes from the side of the head to the front of the head. He first pointed out how little animals, especially mammals, moved their eyes in order to see. Lemurs and all animals below them moved their heads instead of their eyes, and human beings moved their heads in order to see to a greater extent than was usually realised. This was appreciated in the light of the sense of inconvenience when one suffered from a stiff neck. The more an animal felt the need to increase its visual field, the more developed its muscles became. But one could find that some means were taken to compensate for this lack of development of muscles. If the eye was not moved to increase the visual field, the orbit could be moved, thus increasing the avenues of approach to the retina, and in herbivora there was an elongated pupil with the same purpose. Throughout all the vertebrate series there were the same four recti and two obliques. Prof. Whitnall showed by a series of diagrams the changes which occurred in the muscles of the site *pari passu* with the gradual swinging of the visual axes from the side to the front of the head, the angle subtended by the visual and orbital axes varying from 27° to 80°. He dealt in much detail with the change seen in each pair of muscles, and showed illustrations from Lindsay Johnson's atlas of the visual axes in various mammals.

Sir Arthur Keith, in view of the full contributions of his predecessors in this discussion, confined his attention almost solely to the chief modifications which had been gone through by the orbit and the skull in the evolution of binocular vision. Presumably, man began to take on a recognisable human form in the Miocene period, but his ocular outfit existed long before—namely, in the Eocene period—and he preferred for it the name "bifoveate." Even the marmoset had this. The progeny of the bifoveate stock had fared very differently in their evolutionary progress. Some had retained their ancient characters, others, such as man, had shed them. Between them was a series of intermediate forms, seen in living Primates, representing stages in evolutionary progress. By a deft use of these intermediate forms Prof. Elliot Smith had been able to build up a reliable evolutionary history of man's vision and of those parts of the brain which were concerned with that faculty. One of the greatest services rendered to anatomy was Prof. Elliot Smith's clear proof that the evolution of bifoveate vision was the result of sight ousting smell as the dominant sense. Sir Arthur Keith did not consider that the swinging forward of the eyes so that their axes became parallel had anything to do with the reduction in size of jaws, nor that bifoveate vision was a necessary result of arboreal life; he thought it was closely linked with the mode of climbing, and mode of locomotion seemed to have been a dominant factor in the evolution of the true Primates. All bifoveate Primates were jumpers, and they must be able to judge the distance of the branch they wished to reach. The golfer's axiom "Keep your eye on the ball" had a much older counterpart in the jungle, "Keep your eye on the branch." Twenty-four years ago the late Dr. Lindsay Johnson showed that though

monkeys, anthropoid apes, and man had the same form of eye and retina, the same outfit of ocular and orbital muscles, these creatures differed widely in the degree and kind of their eye movements. In ordinary monkeys head and eyes moved together, there was but little power of lateral movement of the eyes. In the great anthropoid apes conjugate movements were free and frequent, convergence could be sustained only during short spells. It was clear that man's visual superiority lay not in the kind of eye with which he had been provided, but in the brain which had grown up behind the eyes. No one, he said, who had watched the gradual dawn of perfect vision between birth and childhood could doubt the truth of evolution; the facts deduced that evening could only be explained by supposing that man had been evolved from a very humble and primitive simian ancestry. But we remained still in the dark as to the evolutionary machinery which had transformed the visual world as seen by the marmoset into that seen by man. When this machinery was explained it must cover all the structural elements as they developed in the body of the embryo and of the foetus. When it could be explained how man came by his vision, then the most difficult part of the problem of evolution would have been solved.

On Thursday, July 16th, Sir John Parsons delivered the Bowman lecture, which appeared at length in our last issue.

On the morning of Friday, July 17th, the session combined to debate on the

MICROSCOPY OF THE LIVING EYE,
the President occupying the chair.

The Cornea.—Dr. Gordon Byers (Montreal) dealt with the cornea, remarking that because of its accessibility and the transparency of its refractive media, the eye early became a field for study by what had come to be called the "direct" method of pathological examination. With increasing accuracy and fullness the changes noted were isolated and described as the objective symptoms or signs of the clinical pictures. But though the direct method did evolve aids of great value, beginning with the introduction of focal illumination by Himley over 100 years ago, limits to its effectiveness were imposed by difficulties of illumination which seemed at the time to be insuperable. The value, he said, of the new method lay rather in its disclosing changes collectively, and in their topographic relations, a service of which the pathologist stood in need. For him it made significant many details which merely as scattered findings were without meaning. To the clinician the method gave fresh opportunities to add to the number and the qualities of his clinical pictures. Pathological changes in the cornea were observable with a special fullness and distinctness by the new method, because of the variety of illumination which focal structural differentiation made available for disclosure. Still, the revelations of the slit-lamp would probably be less novel in the cornea than it would in other components of the organ. He thought that betterment would consist rather in the addition of a wealth of detail and a truer perspective to details already established.

The Vitreous.—Dr. Arthur Bedell (Albany, New York) said the slit-lamp offered a method for the more careful study of vitreous detail than had hitherto been available. The vitreous, when examined by this method, showed innumerable variations in the definition of the folds of the frame-work and the consistency of the fibres in health. In disease the changed frame-work might consist in the massing of fibres and liquefaction and absorption of structures, and in pigmentation. He considered that no case of penetrating injury had been properly investigated until the slit-lamp had been skilfully used; and prognosis in such cases was never exact until such demonstration revealed the presence or absence of tension fibres which might be a cause of subsequent detachment. He gave a series of hints as to the use of the instru-

ment, and showed slides illustrative of the appearances seen in uveitis, retinitis proliferans, detachment of retina, asteroid hyalitis, and traumatic vitreous. In connexion with cataract extraction, Dr. Bedell said there was always a prolapse of vitreous after this operation if the posterior capsule was opened.

The Lens.—This part of the subject was dealt with by Mr. T. Harrison Butler (Birmingham). He said the lens was suspended in the eye like the hub of a bicycle and was completely surrounded by aqueous. The retro-lental space was a cleft filled with aqueous, and it disappeared in cases of degeneration of the vitreous. After the removal of cataract in the young the retro-lental space was greatly enlarged. He said that in cases of congenital dislocation of the lens the zonule might be complete, rudimentary, or absent altogether. When the lens was forcibly dislocated, the zonular lamella might peel off with the fibres of the suspensory ligament, which were not then found attached to the lens. He showed drawings illustrating detachment in lens dislocation, in glass-blower's cataract, and in an example of a shrunken lens. The lens sutures were known to constitute the sites of various kinds of cataract. The lens shagreen he regarded as due to the intimate structure of the capsule itself. He showed that an abnormal growth of the lens zones caused central cataracts, and to the varied forms of zonular or lamellar cataract. He suggested that the varied curves associated with appropriate refractive indices were so balanced that chromatic aberration was corrected.

Mr. Basil Graves dealt chiefly with the optics of these new instruments, and had a good many hints to impart on their successful use. His contribution was chiefly an epidiascope demonstration.

Miss Ida Mann spoke on the embryology of the lens and the correlation of it with slit-lamp appearances. In the first stage shown the lens was present only as an open pit in the surface ectoderm. At this stage could be seen the beginnings of the free cells, which were later seen in the cavity of the lens vesicle, the persistence of which Vogt considered was the cause of anterior axial embryonic cataract. But examination of this and succeeding stages to full term made this unlikely, as the opacities described as occurring in the adult lens were in the neighbourhood of the anterior Y-suture, while the potential cavity of the lens vesicle was immediately under the anterior lens epithelium.

Other participants in the discussion were Mr. Charles Goulden, Mr. Inglis Pollock, Mr. Gray Clegg, Dr. Feingold, Dr. Zentmayer, Dr. Finoff, Dr. McLean, and the President. The openers replied.

READING OF PAPERS.

At the afternoon session on Friday papers were read covering a wide variety of subjects. Mr. Leslie Paton and Miss Mann presented an elaborate thesis on the

Development of the Oculo-Motor Nuclei

and its bearing on the Argyll Robertson pupil reaction. They said that the break in the reflex arc which brought about the Argyll Robertson pupil probably occurred in the secondary intercalated neurone, which had its cell of origin in the anterior corpus quadrigeminum and whose axone passed down and probably bifurcated so as to link up with the third nerve nuclei on both sides. If the Edinger Westphal nuclei were concerned in the innervation of the sphincter pupillæ it was probable that the light reflex fibres were non-myelinated fibres running through the central grey matter straight to the neighbourhood of the Edinger Westphal nuclei. But Magitot contended that the Edinger Westphal nuclei could not be concerned with the control of the sphincter iridis, because in the human foetus neither they nor any of the other anterior accessory nuclei of the third were developed at a time when the light reflex was already existent. That authority had seen the light reflex in a child which was born at the end of the fifth month, whereas

the nuclei in question did not appear until the seventh month of intrauterine life. Mr. Paton suggested a reinvestigation of the embryology of the third nerve nucleus and its accessory nuclei, as that might throw light on this difficult question. A result of the examination of human embryos at various stages undertaken by one of the authors of this paper was that it seemed that the differentiation of the third nerve nucleus into its component parts commenced at a comparatively early stage, being well advanced before the end of the fifth month. Reference was made to the work of Kappers, and Mr. Paton said it could be shown that in human embryos the median nucleus appeared early, before the accessory nucleus, at a time when the swinging round of the eyes from the sides to the front of the head was taking place, while the appearance of the accessory nucleus was delayed until the first signs of differentiation of the margin of the optic cup to form an irido-ciliary region. In foetuses of three and a half to four months the typical small cells of the accessory nuclei could be recognised, the anterior layer of the ectodermal part of the iris at the same time giving rise to the muscle-cells of the sphincter pupillæ. Thus, in both phylogeny and ontogeny the appearance of the median nucleus was associated with the possibility of convergence, and that of the Edinger Westphal nucleus with the possibility of a light reaction.

Glioma Retinæ.

Dr. J. Van der Hoeve (Leiden) showed photographs of metastases of glioma retinæ in various parts of the head of a child after binocular enucleation, with the result of causing a massive disfigurement of the whole head and face. Exenteration of the orbit showed an optic nerve three to four times the normal size. The enlargement of the optic foramen he regarded as of serious prognostic import. In unilateral glaucoma the eye should be enucleated. Usually bilateral glaucoma did not come to the surgeon's notice until the disease had totally blinded one eye. In such cases the blind eye should be removed and the other should be treated by irradiation, though the results of this latter were not, he thought, very encouraging. The author thought that radiographs of the optic foramen should be more frequently carried out, as they would afford valuable diagnostic information, as well as giving a clue as to prognosis and treatment. Radiotherapy did not yet seem to have brought about many absolute cures of glioma.

Blood-Chemistry of Patients with Primary Cataracts.

Dr. Maxwell Langdon (Philadelphia) read a paper in which he pointed out that certain physical conditions accompanying lens degeneration caused also urinary changes, and he had been engaged since 1920 in an investigation of the blood-sugar and sugar-tolerance, also the blood-urea nitrogen and creatinin. Mostly his findings had been negative, and the analysis seemed to be of value only as regards sugar, several cases of potential diabetes having been discovered in which this appeared to be the only indication.

Intracapsular Extraction of Cataract.

A paper on this subject was read by Dr. A. H. H. Sinclair (Edinburgh), who showed in connexion with the paper some new instruments and explained their uses. He said the methods of intracapsular extraction practised to-day could be stated thus: (1) Dislocation and expression of the lens by pressure on the outside of the eyeball; (2) the dislocation and extraction of the lens by taking hold of its anterior capsule and removing it by traction; (3) a combination of traction and external pressure either simultaneously employed or with pressure following on forceps dislocation. He said his own method of intracapsular extraction now described was carried out with blunt forceps. The resultant vision in which the lens was removed completely came out as follows: 6/5 in two cases, 6/6 in 16, 6/9 in eight, 6/12 in one, 6/18 in one, 6/60 in one. He

explained that in nine cases the lens were not extracted complete in the grasp of the forceps. In these the vision was 6/5 in one, 6/6 in three, 6/9 in one, 6/12 in two, 6/18 in two. In his second series of 21 cases, since he had used his "expressor guard," there had been no loss of vitreous, and in this series there was only one case of iritis. The average vision in his first series was 6/11, in the second 6/7. Dr. Sinclair gave a remarkable cinematograph demonstration of the actual operation.

Late Results of Intracapsular Cataract Extraction.

Dr. Arnold Knapp (New York) related some late results of intracapsular cataract extractions in his practice. He said that criticism had been levelled against intracapsular cataract extraction because, in addition to vitreous loss in many, there was undue damage caused to the eye, the pupil was displaced, and set going degenerative changes which eventuated in damage. Some advocated retention of the posterior capsule, as it constituted an important support for the vitreous. Dr. Knapp submitted that the best answer on these points was furnished by a further examination, after a number of years, of patients on whom the intracapsular operation had been done. He did not think the ideal operation had yet been found. With this object he had followed up and re-examined as large a proportion of the 200 consecutive intracapsular cases done between 1910 and 1919 as he was able. He gave tables of results which were, on the whole, quite favourable. A small escape of vitreous did not seem to have any special significance.

Lt.-Col. H. Smith, I.M.S., said Dr. Knapp's results were very encouraging to those who thought of embarking on the intracapsular extraction of cataract, and the series reported showed that it was possible to exaggerate the seriousness of the escape of a small quantity of vitreous.

Sir Wm. Lister expressed his satisfaction that Dr. Knapp's contribution showed again that a successfully performed intracapsular extraction did wear. He had himself been astonished by the good results of the intracapsular operation as carried out by Colonel Smith, even in the bad cases, and he had himself investigated 91 cases in India. He asked ophthalmic surgeons to watch their cases in which they did the cataract operation and see what happened to them in a few years, and to base their views upon what they found.

Dr. Sinclair also considered that Dr. Knapp's series of operation results were very encouraging to those whose ambition it was to embark on this proceeding. He had not himself lost an eye after this operation in two and a half years.

Mr. D. V. Giri (Eastbourne) said that in many cases of hypermetropic cataract the vitreous was already fluid and filled with opacities, and when this was so the escape of a little vitreous even did good, as otherwise the degenerate vitreous might act as an irritant and cause further damage.

Dacryocystenectomy.

Mr. Eric A. Thomson (Beyrout) explained that this operation was intended as a substitute for dacryocystectomy, and was mostly indicated where the latter would be chosen, but hesitation was dictated by the infirmity or nervousness of the patient. The results were equally good. The operation consisted in the obliteration of the sac, canaliculi, and puncta by an inflammatory process caused by the injection of saturated corrosive sublimate aqueous solution, followed by absolute alcohol, strong tincture of iodine, alcohol again, and ether. The puncta were touched by the actual cautery as an extra precaution, and the cornea must be protected from the drugs employed. A pressure bandage and pad were kept over the region of the sac for six days.

Removal of Cataract in its Capsule.

Mr. John Hern (Darlington) contributed a paper in which he described his method of removing a cataract in its capsule, requiring the use of only two special instruments. These were: (1) An eye speculum

which could be adapted to any face or either eye. A spring separated the blades, and by screw adjustments the lids could be slightly removed from the eyeball before operating. (2) A pair of forceps with entirely separate blades, fitted together by the ordinary "Smellie" lock. A preliminary iridectomy should be done, and the corneal incision should be limbal and fairly large. The chief danger was that from possible loss of vitreous, but with the lids so well under control by the special speculum there had been little trouble on this score; and he considered that the clear pupil and the impossibility of the occurrence of "after-cataract" more than compensated for this should it occur.

Lens Antigen Treatment of Cataract.

Dr. A. E. Davis (New York), in a paper with this title, said that by the use of lens antigen alone almost every case of cataract in its early incipency could be arrested. Immature cataracts, up to 50 per cent. loss of function, in 85 per cent. of the cases could be arrested, and in more than half the cases there was improved vision. Mature senile cataracts he preferred to remove by operation. The prognosis was less favourable the later the cases were treated by lens antigen. The longest time he had had these cases under observation was four years, and the average loss of vision in the cases was about 12 per cent.

Recovery of Visual Field in Pituitary Tumours.

Dr. R. C. Davenport (London) reported two cases of pituitary tumour which were under the care of Mr. Foster Moore. Neither of them had marked glandular signs, but each showed primary optic atrophy and temporal hemianopia. In both the visual signs had been present some years, and had since been watched for three to five years. X ray examination revealed extensive bone erosion in the pituitary region in both patients. In one case one eye was blind, the vision in the other being 6/18. The whole temporal visual field was lost. The other patient had only the nasal half of the field in one eye, with an acuity of 6/12, that of the other eye being only 6/60, with only a small upper nasal section of the field remaining. The treatment of both was by irradiation of the head, directed to the pituitary region, and the fields had improved, but the visual acuity remained as before. A question which arose was as to how much the recovery might be spontaneous, and how much it was due to the shrinkage of the tumour from the application of the rays.

Cerebro-Macular Degeneration.

Dr. Gordon Holmes and Mr. Leslie Paton presented a paper on this subject. They said they had been able during recent years to examine ophthalmoscopically a number of cases of cerebro-macular degeneration of the Batten type. In most of them the retinal changes were fairly well marked when the cases came under observation. The occurrence of the disease in two members of a family led to the whole family being kept under inspection, and this resulted in the very earliest stages of the development being observed in a third member. The first noticeable change was the appearance of a small whitish area at the macula, surrounded by a reddened ring. Later, wavy radiating white streaks appeared on the retina; then the macula showed dotting, with granular pigment in and around the whitish area. The optic disc became paler and the vessels diminished in size. In the third stage the evidences of retinal atrophy spread out to the periphery, but the evidences were still most marked at the macula. Clinically, the cases were most closely related to amaurotic family idiocy.

Genesis of Myopia.

Mr. Ernest Clarke (London) examined the various inherited influences which had been suggested as the origin of myopia, and arrived, by a process of exclusion, to a confirmation of the view of Sir Arthur Keith that the origin of myopia was an inherited disorder affecting the very early growth of the sclerotic. He suggested that some bad cases of high myopia were

a manifestation of a disease of the coats of the eye, with myopia as a sequel, not as a cause.

Uveal Pigment in Diagnosis and Treatment of Sympathetic Ophthalmia.

A paper with this title was read by Dr. Alan C. Woods (Baltimore). He explained that the diagnostic tests were a complement-fixation reaction in the blood-serum against an antigen of uveal pigment and an intradermal test to determine the patient's specific hypersensitivity to uveal pigment. The treatment was based on the idea of removing the specific pigment hypersensitivity of the person by the repeated injection of small quantities of uveal pigment, which, at the same time, stimulated the production of specific antibodies. Dr. Woods's view was that this treatment was of definite value in sympathetic ophthalmia, but he did not regard it as an absolute specific. There was no reason against it being associated with other treatment. Dr. Woods said he did not think the aetiology of sympathetic ophthalmia had yet been fully demonstrated, but he considered that there was usually an allergic phase in the disease, and that uveal pigment was at least one of the factors concerned in this phase.

CONSTITUTION OF FUTURE CONVENTIONS.

A general meeting of members of the Convention took place on Thursday afternoon for the purpose of considering whether future conventions should be of an international character on a pre-war basis. After discussion a resolution was moved by Dr. Lucien Howe, and seconded by Dr. G. Ring to the following effect:—

That this Convention of English-speaking ophthalmological societies hereby empowers its President, Mr. E. Treacher Collins, to appoint a standing committee of five, of which he shall be chairman. The duty of this committee shall be to obtain such co-operation as is possible from representatives appointed by various national ophthalmological societies in promoting matters of international ophthalmological interest, for example: (a) Aiding or initiating measures by international intercourse likely to prevent the dissemination of diseases of the eye and the lessening of hereditary blindness; (b) the establishment of uniform methods of recording results of visual tests and other matters pertaining thereto; (c) the interchange of ophthalmological literature; (d) the promotion of international ophthalmological congresses.

This resolution was adopted as well as a further resolution, proposed by Dr. Howe and seconded by Dr. Ring, thanking the English organisers for their hospitality and for the general excellence of the arrangements.

VISITS AND FUNCTIONS.

During the week members of the Convention visited a number of institutions, such as the Royal Institution, the Royal London Ophthalmic Hospital, St. Margaret's Hospital, the L.C.C. Myopia School at Islington, St. Dunstan's, the Royal Westminster Ophthalmic Hospital, the Central London Ophthalmic Hospital, the National Library for the Blind, the Royal Eye Hospital (St. George's Circus), the Royal Normal College for the Blind, and the White Oak Ophthalmia School at Swanley.

At St. Dunstan's Hostel for the training and care of war-blinded men, the visitors were received by Sir Arnold Lawson, Chairman of the Ophthalmic Advisory Board, and by Captain Ian Fraser, M.P., Chairman of the Council, who gave interesting facts and figures with regard to the success of the work at St. Dunstan's. A total of about 1800 blinded soldiers had passed through the Hostel, of whom roughly 1000 cases were due to gunshot wounds or to explosive shell or bomb; under 300 were due to actual bullet wounds. A few were the result of concussion and accident; only three injuries were attributable to bayonet wound. A tour was made of the wards, classrooms, and workshops, where the visitors had the opportunity of seeing the skill and cheery spirit shown by the blinded men.

The Convention opened with a reception at the Royal College of Surgeons of England. Sir William

and Lady Lister gave a garden party at Aubrey House on Wednesday afternoon. There was a reception at the Wellcome Historical Medical Museum on Thursday evening.

An *Official Banquet* at the Guildhall terminated the proceedings of the Convention. Mr. Treacher Collins took the chair, and the company included many distinguished guests. H.R.H. the Duke of Connaught, in replying to the Loyal toasts, said that the more the English-speaking peoples worked together, the greater the prospect of peace and prosperity for the whole world. The medical people of London were to be congratulated on their hospitality to co-workers from all parts of the world. The President, in proposing the English-speaking Ophthalmological Societies, emphasised the common inspiration of the peoples represented and the common purpose of the gathering. The complete ophthalmologist, he said, was a practitioner of medicine, a surgeon, a neurologist, a physiologist, a mathematician, a physicist, and above all, a psychologist. Sir John Parsons, replying for the Ophthalmological Society of the United Kingdom, remarked that the Society, since its foundation in 1880, had gone on from success to success, an ascent which culminated in the Convention just concluded. America, which owed much to English ophthalmology, was now repaying that debt, not in gold, but in the coinage of inspiration returned. Dr. de Schweinitz, on behalf of America, and Dr. Gordon Byers, on behalf of the Dominions, thanked their hosts for their hospitality, and laid stress on the essential unity and similarity of outlook of all the English-speaking peoples. Mr. J. H. Fisher proposed the toast of the Guests, which was responded to by Sir George Wyatt Truscott, representing the City and Corporation of London, Sir Humphry Rolleston, representing the Royal College of Physicians, and Sir John Bland-Sutton, representing the Royal College of Surgeons. Mr. E. Clarke proposed the health of the President, Mr. Treacher Collins, whose name, he said, was known and respected where ophthalmology was practised and taught.

On Saturday, delegates visited Oxford, where they lunched at Keble College, or Cambridge, where they were entertained at Trinity College.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. O'Hea is placed on the Retd. List with the rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. T. S. Coates to be Lt.-Col., vice Lt.-Col. C. G. Thomson, to ret'd. pay, on account of ill-health.

Temp. Capt. R. W. Markham (Dental Surg.) relinquishes his commn. on account of ill-health and retains the rank of Capt.

TERRITORIAL ARMY.

Lt.-Col. R. C. Dun, having attained the age limit, is retired and retains his rank, with permission to wear the prescribed uniform.

Lt.-Cols. G. C. E. Simpson and J. H. Ray to be Bt. Cols.

Capt. E. M. Douglas-Morris to be Maj. (Prov.).

Capt. E. M. Jenkins is retired and retains his rank.

Capt. F. E. H. Keogh to be Maj.

Lt. C. Alison resigns his commn. and retains his rank.

2nd Lt. H. E. Suter (late Middlesex Regt.) to be Lt. *Supernumery for Service with the O.T.C.*—A. S. Gough to be Lt. for service with the Medical Unit Univ. of London, O.T.C.

TERRITORIAL ARMY RESERVE OF OFFICERS.

W. M. Robertson (late R.A.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. T. C. St. C. Morton is promoted to the rank of Squadron Leader.

We regret to announce the death in his seventy-sixth year of Lieutenant-General Sir Lancelotte Gubbins, formerly Director-General A.M.S.

Correspondence.

"Audi alteram partem."

IS THERE A SEASONAL PERIODICITY IN SERUM RASHES?

To the Editor of THE LANCET.

SIR,—During my last years in Glasgow a record was kept of the serum rashes which occurred in the diphtheria wards with a view to determine whether certain batches of serum gave rise to an unusually large number of rashes. Three serums were used, Burroughs Wellcome, Parke Davis, and Hoechst, these being given in different wards. After I came to London in 1914 the record was not continued sufficiently long to determine the point for which the recording was originally instituted, but the figures suggest another point which has not, so far as I know, been raised—namely, the seasonal periodicity of serum rashes.

In Table I. the monthly admissions from diphtheria with the number of rashes are given for the

TABLE I.

Month.	1913.		1914.		Total Cases.	Total Rashes.	Percentage of rashes.	Theoretical number.
	Cases.	Rashes.	Cases.	Rashes.				
	(1)	(2)	(3)	(4)				
Jan...	70	12	56	8	126	20	15.9	19.4
Feb...	52	14	42	2	94	16	17.1	14.5
March...	63	12	43	10	112	22	19.6	17.2
April...	63	12	23	2	91	20	18.4	14.0
May...	50	15	33	7	85	22	18.6	13.1
June...	49	11	27	3	76	14	18.4	11.7
July...	46	6	31	4	77	10	13.0	11.8
Aug...	59	1	21	—	80	1	1.3	12.3
Sept...	77	11	48	5	125	16	12.8	19.3
Oct...	70	14	53	4	123	18	14.6	18.9
Nov...	59	11	46	9	105	20	19.1	16.2
Dec...	74	4	34	3	108	7	6.5	16.6

years 1913 and 1914 in columns 1 to 4, and the totals in columns 5 and 6. In column 7 the percentage of the rashes occurring in the different months is given, and in column 8 the expected number of rashes if the frequency of rashes were uniform throughout the year. As the figures are small, they have been collected together in the four seasons of the year in Table II.,

TABLE II.

—	Cases.	Rashes.	Percentage of rashes.	Theoretical number.
Jan.—March ..	332	58	17.5	51.5
April—June ..	252	56	22.4	39.0
July—Sept. ..	282	27	9.5	43.5
Oct.—Dec. ..	336	45	14.8	52.0

in which the number of cases, the number of rashes, and the expected number of rashes are shown. When the ordinary χ^2 test of Pearson is applied to these figures it is found that χ^2 is equal to 14.3, a divergence which would only occur in three samples out of 1000 on the laws of chance. It is, therefore, strongly suggested that there is a seasonal variation in the frequency of serum rashes. This suggestion can be easily confirmed or refuted by those in charge of large hospitals. It is a point which has great importance in immunity and epidemiology. If this variation really exists it shows that susceptibility as determined by the seasonal changes in the environment may be sufficiently important to modify greatly the progress of an epidemic, so that the epidemic might even, in certain cases, depend more on the physiology of the host than on the infecting power of the organism. This seems the only conclusion, as it is very unlikely that serums stored in a cold chamber will alter in quality to any extent with the seasons of the year.

I hope this short note will result in a sufficient record of observations by those who possess the information, either to prove or disprove it.

I am, Sir, yours faithfully,

JOHN BROWNLEE, M.D., D.Sc.

National Institute for Medical Research, July 20th, 1925.

OATMEAL AND RICKETS.

To the Editor of THE LANCET.

SIR,—With regard to Prof. E. Mellanby's investigations on rickets, referred to in your issues of April 11th and May 23rd, 1925, I suggest that in view of the report by Messrs. Webster and L. Hill on "The Causation and Prevention of Rickets" (*British Medical Journal*, May 23rd, 1925, p. 956) the pro-rachitic effect of oatmeal is in all probability due to the very high percentage (5.9 per cent.) of fat which it contains, and the consequent formation by it in the intestines of insoluble calcium soaps which are excreted unabsorbed in the faeces. Prof. Mellanby himself considers that this pro-rachitic substance is "associated with the fatty acids" as it can be obtained by the saponification of oatmeal with soda and the extraction of the mixture with petrol-ether.

Percentage content of fat in—

Oatmeal*	Maize*	Barley*	Rice*	Wheat*	Wheaten flour*	Germ of wheat†	White bread†
5.9	4.3	1.6	0.3	1.7	0.9	13.1	0.46

* Feeds and Feeding, Henry (Madison, Wis., U.S.A., 1904).

† Notter and Firth, third edition, pp. 305 and 310.

From the table given above it will furthermore be seen that the pro-rachitic action of the cereals investigated by Prof. Mellanby (with the exception of wheat) corresponds in a striking manner to the percentage of fat which each contains. Differences in the chemical constitution of these fats may also partly account for the different rachitic values of the cereals in which they occur.

The rachitic action of wheat is somewhat anomalous; wheaten flour which contains 0.9 per cent. of fat is stated to be less rachitic than rice which contains only 0.3 per cent. of fat, yet bread made presumably from such flour, and containing approximately only half the percentage of fat of the original flour—i.e., 0.45 per cent.—was found to be markedly rachitic in action, puppies fed on large amounts of bread developing rickets "most readily"; moreover, the addition to the diet in quantity of the germ of wheaten flour which contains 13 per cent. of fat was found to interfere consistently with the proper calcification of bone.

I am, Sir, yours faithfully,

J. W. TOMB.

Mines Board of Health, Asansol, Bengal, India,
June 25th, 1925.

THE DANGER OF INCOMPATIBILITY IN BLOOD TRANSFUSION.

To the Editor of THE LANCET.

SIR,—In treatment by transfusion of blood it is of the greatest importance to select a donor whose red cells are compatible with the serum of the patient. Neglect of such a precaution may entail serious symptoms and even death. Individuals who present themselves at hospitals as prospective donors may state that they belong to, say, group I. or group II. In an emergency such a statement might be accepted as true without further investigation—e.g., where the patient has recently been grouped as a precautionary measure, and if the ascertained group of this patient happens to be compatible with the stated group of the donor. Under such circumstances the transfusion might be proceeded with forthwith.

This letter is written in order to call attention to the need of not accepting too readily as actually true a statement from a donor with reference to his blood group. An example may make this clear. At a large London hospital it was decided to transfuse a patient. This patient had been grouped while in that hospital as group II. (using B. W. and Co.'s sera). A donor presented himself as available for this patient and stated that he himself was a group II., since his blood had been so grouped a fortnight previously at another large London hospital. As a precautionary measure the blood of the patient and of the donor were put up against each other, and that of the donor was also grouped by means of stock grouping sera (B. W. and Co.'s). It was then found that the donor's blood was (i.) incompatible with that of the patient, and (ii.) belonged to group III.

Had the donor's statement been accepted and the transfusion performed, a fatal result might have occurred. Such an incident suggests that the blood of patient and prospective donor should always be tested against each other. Further, the eye alone should not be depended on for detecting the presence of agglutination, but a strong lens or a microscope should be used, more especially if stock serum is used for grouping. A fatal result has occurred when the eye alone was depended on.

I am, Sir, yours faithfully,

E. L. HUNT,

Bacteriologist, St. George's Hospital, S.W. 1.

July 18th, 1925.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 15TH.

Custard and Egg Powders.

Mr. WALTER BAKER asked the Minister of Health whether he had received a copy of the report on custard and egg powders which had been presented to the Monmouthshire County Council by the President of the National Analysts' Association; and whether, in view of the fact that these powders were in the main dyed starch and that six eggs to the ton was sufficient to comply with the law, he proposed to take any action.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: Yes, Sir, my right hon. friend has received a copy of the report. He has no power to lay down any rules as to the composition of custard and egg powders so long as they are not injurious to health.

Sanitary Inspection of Offices.

Colonel DAY asked the Home Secretary if he was aware that divers Metropolitan borough councils had made representations suggesting that the sanitary officers should be empowered to inspect offices where wage-earners were employed in the same way as factories and workshops; and would he consider introducing legislation with a view to the protection which was afforded workers in factories and workshops being extended to office workers.—Mr. G. LOCKER-LAMPSON (Under Secretary for Home Affairs) replied: No such representations have been made to the Home Office, but I understand that representations to this effect have been received by the Ministry of Health from two of the Metropolitan borough councils. My right hon. friend is afraid he cannot promise any legislation in the direction suggested.

THURSDAY, JULY 16TH.

Publication of Trevethin Committee Evidence.

Mr. SNELL asked the Minister of Health whether Colonel Harrison, a permanent official of the Ministry of Health, was acting under instructions when, at the recent congress of the Royal Institute of Public Health, held at Brighton, he prevented Mr. Wansley Bayly, the hon. secretary of the Society for the Prevention of Venereal Diseases, from quoting evidence which was given before the Trevethin Committee, on the ground that such evidence was confidential; whether this evidence was in fact confidential; and would he undertake that permanent officials of his department, except when acting under his instructions, would not prevent valuable information on important health subjects from being given to the public by competent medical men.—Mr. NEVILLE CHAMBERLAIN replied: No instructions in this matter were given to the officer referred to. As regards the second part

of the question, I am informed that no pledge was given to witnesses before the Trevethin Committee that their evidence would be regarded as confidential and not published, but the evidence has not been published and was not available to members of the congress, and its chairman ruled that quotations from such evidence would be out of order. I am unable to accept the implication conveyed in the last part of the question.

Uninsured Persons.

Mr. HERBERT WILLIAMS asked the Minister of Health the number of employed persons in this country not insured under the National Health Insurance Acts.—Mr. NEVILLE CHAMBERLAIN replied: No precise information of the kind desired by my hon. friend is available. The number of employed persons aged 12 or over in Great Britain in 1921, according to the census of that year, was 17,403,053, of whom it is estimated that 16,432,000 were over 16, and the estimated number of persons entitled to benefits under the National Health Insurance Acts in the same year was 15,134,000. The latter figure, however, includes some persons who had ceased to be employed, and for this and other reasons it is not directly comparable with the census figure. The balance of 1,298,000, therefore, is only a rough approximation to the number of uninsured employed persons, of whom the principal groups are non-manual workers earning more than £250 a year and persons engaged in excepted employment under the Crown and local authorities and certain statutory companies.

Health Visitor's Salary.

Mr. GERALD HURST asked the Minister of Health whether he was aware that the Dorset County Council was advertising for a health visitor at a salary of £148 a year, out of which the person appointed had to contribute £7 15s. a year towards the superannuation funds and to find her own bicycle; and whether, seeing that this salary, with its yearly increments, was far below the normal scale, he would draw this council's attention to the effect of its action upon the standard of trained nurses likely to be attracted into the public health service.—Mr. NEVILLE CHAMBERLAIN replied: Yes, Sir, I am in communication with the county council on the subject.

Optical Treatment for Panel Patients.

Mr. BLUNDELL asked the Minister of Health the difference between optical treatment, which was previously allowed to be given as an additional benefit under the Health Insurance Acts, and ophthalmic treatment, as now allowed.—Mr. NEVILLE CHAMBERLAIN replied: The difference is that with the new definition of the benefit it has been possible to make arrangements whereby an insured person is in a position to obtain the advice of an ophthalmic specialist when it is required in the opinion of his medical practitioner. Under the previous definition it was a matter of doubt how far this could be done.

Scarlet Fever from Ice-Cream.

Colonel DAY asked the Minister of Health if he was aware of the recent outbreak of scarlet fever in Portsmouth which was traceable to ice-cream made by one manufacturer in whose employ a boy assistant was found to be suffering from the disease; would he, in the interests of public health, make an order that early notice of any illness of the principals or employees of an ice-cream manufactory should be made immediately to the local medical officer of health, and that such notice should become obligatory; and would he consider the advisability of powers being vested in medical officers of health so as to allow the inspection of places where ice-cream was made, and inspection of persons occupied with the manufacture or distribution of ice-cream.—Mr. NEVILLE CHAMBERLAIN replied: I have received a copy of the report of the medical officer of health on the outbreak referred to. Provision is already included in the Infectious Diseases (Notification) Act and in regulations made by my department for the notification of all cases of any of the principal infectious diseases, and a special provision is included in a Portsmouth local Act requiring manufacturers of and dealers in ice-cream to give notice of the outbreak of any such disease amongst their employees. I doubt whether it would be practicable to enforce a regulation that all cases of illness, however slight, should be notified. With regard to the regulation of places where ice-cream and other food is prepared, many local authorities in addition to the town council of Portsmouth have obtained special local Act powers as to ice-cream.

FRIDAY, JULY 17TH.

The Summer-Time Bill.

The Summer-Time Bill was considered on report. On Clause 1 (which makes Summer Time permanent and extends the period prescribed in the previous Acts), Sir H. CAUTLEY moved an amendment to leave out Subsection (2), the effect of which was to limit the period

of Summer Time to that fixed by the existing law—i.e., from 2 o'clock on the Sunday morning following the third Saturday in April to 2 o'clock on the Sunday morning following the third Saturday in September. He said that there was no objection to the proposal to make summer time perpetual; the only point of controversy was as regarded the date on which Summer Time should begin and end. The promoters of the Bill proposed to add about a fortnight at the beginning of the period, and a fortnight or three weeks at the end, making Summer Time finish on the first Saturday in October. Although a very good case could be made that no sufficient time had elapsed since the compromise of 1922, he felt that this was a matter which should, if possible, be amicably settled. The promoter of the Bill had made an offer which he thought generous, though he (Sir H. Cautley) could not accept it as such. This offer was to give up the early part of the period leaving the commencing date as at present, provided the opponents of the Bill would agree to the full period proposed by the Bill at the end—namely, the first Saturday in October. As chairman of the Conservative Agriculture Committee, he wished to say that they would accept that compromise if the House was willing to accept it. (Hon. Members: "No.")

Dr. GRAHAM LITTLE said he wished to voice more especially the considered opinion of the medical profession inside and outside the House. Arguments in favour of the Bill seemed so overwhelming and objections so trivial that it was hard to understand why there should be any difficulty about it. This was a measure of far-reaching importance to the health and happiness of the community. It was really one of the most important Bills that had ever been before the House or the country. He would point out the profound significance of medical unanimity on this Bill. The British Medical Association in 1923 passed this resolution: "That the British Medical Association regrets that Summer Time has been curtailed this year, as it is our opinion that Summer Time is beneficial to the health of the nation." In 1921 the Society of Medical Officers of Health passed this resolution: "The Society regards the institution of Summer Time as a great benefit to the community as a whole and can find no sufficient evidence to support the view that it must prove detrimental to the health of infants and young persons." That resolution was confirmed in 1923 and 1924. In connexion with a deputation to the Home Secretary the medical officers of health brought to his notice the resolution. He (Dr. Little) had been connected with the staff of a London hospital for children, and he said without hesitation that the statements made about the difficulty of getting children to sleep was unmitigated "tosh." He urged very strongly that there should be no curtailment of the period of Summer Time.

After further discussion, the closure was moved by the promoter of the Bill (Lieut.-Colonel LAMBERT WARD), and on a division Sir H. CAUTLEY's amendment was rejected by 204 votes to 68.

An amendment in the name of Sir R. SANDERS, providing that Summer Time should begin on the third Saturday in April instead of the first Saturday as proposed in the Bill, was then agreed to without a division.

Sir H. HOPE moved a further amendment to fix the last Saturday in September instead of the first Saturday in October as the date of the termination of Summer Time, which after some discussion was defeated by 228 votes to 56. The Bill was then read a third time without a division.

Therapeutic Substances Bill.

Mr. NEVILLE CHAMBERLAIN (Minister of Health), in moving the second reading of the Therapeutic Substances Bill (which has already passed through the House of Lords), said he believed that it would have the assent of all parties inasmuch as it was no exaggeration to say that the lives of many people would benefit from its early passage into law. It dealt with the standardisation of vaccines, sera, toxins, antitoxins, antigens, and insulin. Practically all civilised countries had an official standardisation for these various substances and as to their purity and potency—France, Germany, Italy, Spain, the United States, Norway, Sweden. Preparations which had failed to pass the test of foreign countries were liable to be imported here. It was proposed that no one should be allowed to manufacture these substances without a licence. A joint committee would be set up consisting of the Minister of Health, the Secretary for Scotland, and the Home Secretary for Northern Ireland, with power to make regulations, to prescribe standards and tests, and from time to time to make conditions. Veterinary substances were excluded except in so far as might be necessary in certain cases.

Major-General Sir R. LUCE said in carrying this matter one stage further they had behind them medical and scientific opinion. The substances dealt with were medically roughly of three kinds. First there were those extremely difficult chemical compounds, such as salvarsan. The regulations under the Bill would help to make quite certain that these

substances did not get into the hands of people who were not qualified to deal with them. He hoped that in committee it would be possible to add to the Advisory Committee a representative of the body of general practitioners who were directly responsible for the use of these substances, possibly nominated by the British Medical Association.

Colonel SINCLAIR said there was a time when the materials were for the most part inorganic, and could be standardised by tests, but they were getting right away from that now to the use of organic extracts, extracts from various glands in human beings or animals as substitutes for ordinary drugs. Obviously, these required to be subjected to physiological or chemical tests, and it was very important that they should be subjected to those tests by recognised authorities. There was, for example, pituitrin, an extract from a small gland in the brain. This was a very potent substance and was used for a variety of purposes. It was quite possible that practitioners using a particular brand of pituitrin might be quite accustomed to its effects, but in an emergency a man might use a brand which had not been adequately standardised and which might be five or ten times as strong as the brand with which he was familiar. In such a case where the intention was to stimulate a wound sufficiently to secure contraction, the effect of a drug of unknown strength might be to cause a rupture of the wound from over-stimulation. Another illustration was furnished by the valuable substance known as insulin. With the wider use of this drug other manufacturers of it would spring up and their products might be of various standards, and there might be preparations altogether too strong for general use. He cordially supported the measure.

Dr. VERNON DAVIES said the Bill was long overdue. He thought, however, that certain alterations would require to be made so that a serum which might be produced abroad, and had certain special properties, should be allowed to be brought in under licence without all the restrictions imposed by the Bill as it stood. He suggested that as many as possible of the Members of the House who were medical men should be placed on the committee to which the Bill was referred.

Mr. A. V. ALEXANDER, on behalf of the Labour Party, supported the Bill.

The Bill was read a second time and committed to a committee of the whole House.

Diseases of Animals Bill.

Mr. E. WOOD (Minister for Agriculture) moved the second reading of the Diseases of Animals Bill, a measure to provide for contributions to be paid out of moneys provided by Parliament as compensation for the slaughter of cattle in England and in Northern Ireland on the ground of disease.

Dr. VERNON DAVIES asked the Minister with regard to the provision as to the slaughter of cattle in case of the existence or suspected existence of tuberculosis what evidence he required? Was it to apply to tuberculosis of the udder with the consequent production of tuberculous milk, and the danger of communicating tuberculosis of the lungs, or was it to apply to tuberculosis of the lungs, and in that case would reliance be placed simply upon the tuberculin test? He also asked the Minister if he would bear in mind the possibility of vaccine treatment for these cattle, an experiment which he believed was just about to be commenced. If it were successful it would probably effect a great saving to the State.

Sir R. LUCE said that the tubercle was of two kinds. There was a distinct form of tuberculosis which might be absolutely local and not circulating in the blood at all and in no way affecting the eatable parts of the food. The muscle of the body which formed the largest portion of the food was very rarely infected with tubercle at all. There were, of course, cases in which the udder of the cow which was infected and produced tuberculous milk was practically the only part of the cow that was affected, and this class of cow might be the most important class to destroy as they were the most potent source of tubercle to children. But the rest of the carcass apart from the udder might be absolutely innocuous to the community. It would be a great waste that such animals should be completely destroyed.

Lieut.-Colonel FREMANTLE said he preferred to err on the side of safety, but it seemed to him ridiculous that they should go in for a policy of slaughter in these cases when they were on the brink of discoveries which would absolutely eliminate the necessity of slaughter. If meat was properly butchered and marketed there would not be the same danger of meat being unfit for consumption being exposed as food. If they took greater precautions they could allow a great deal of latitude. Although he believed this Bill was necessary and the compensation to be paid was necessary, he maintained that hand in hand with it the Ministry of Health should go forward with the policy of seeing that butchering was carried out on proper principles and of ensuring better veterinary inspection.

Mr. WOOD said he was satisfied on such inquiries as he had been able to make from the Minister of Health that

if the local authorities did their duty, as he had every reason to think they did, there was no meat passing into human consumption that was or might be prejudicial to human health. But if any case could be established that there was a chance of unsound meat being sold, he would be very willing in conjunction with the Minister of Health to take effective means to stop it.

The Bill was read a second time and committed to a committee of the whole House.

MONDAY, JULY 20TH.

Civil Service Pensions in India.

Sir CHARLES OMAN asked the Under Secretary of State for India whether European British subjects serving in the provincial services in India were entitled to retire on a proportionate pension, similar to that recommended by the Lee Report for the superior civil services; and, if not, whether any measures were contemplated for assimilating their position to that of the other civil services in this respect.—Earl WINTERTON replied: Eligibility under the Premature Retirement Rules is limited to members of the All India Services. No general extension of the right to retire under these rules is contemplated, but the Government of India is examining in consultation with local governments the possibility of entertaining applications from individual officers whose circumstances may appear to be of a very exceptional nature.

Burdens of the Milk and Dairies Act.

Mr. EVERARD asked the Minister of Health whether, in view of the burdens which the Milk and Dairies (Consolidation) Act, 1915, was likely to place on the owners and occupiers of agricultural holdings, he would consider the further postponement of the operation of this Act.—Sir KINGSLEY WOOD replied: I think my hon. friend is unduly apprehensive as to the probable effect of the Act on the owners and occupiers of agricultural holdings, and in view of its importance as a public health measure my right hon. friend cannot contemplate the introduction of legislation to provide for its further postponement.

Valuation of Approved Societies.

Mr. THOMAS WILLIAMS asked the Minister of Health whether the valuation of all approved societies under the National Health Insurance Act had taken place up to one period; if not, would increased benefits of societies whose valuation was delayed be made retrospective to July, 1925; and the reason why all valuations were not made at the same period and additional benefits made available at the same time for all members.—Sir KINGSLEY WOOD replied: For the purposes of the second valuation approved societies and branches were divided into two groups, to be valued respectively as at Dec. 31st, 1922, and Dec. 31st, 1923. For those which have been valued as at the former date the schemes of additional benefits following this valuation operate from July 6th, 1925, and for the other group the scheme will commence in July, 1926. These arrangements were agreed to by the Consultative Council representing approved societies of all types, and were found to be necessary in order to avoid either a considerable increase in the number of the valuers and their staff or alternatively a prolongation of the period elapsing between the date of valuation and the commencement of the additional benefits provided as the result of the valuation.

Coroners' Inquiries in Murder Cases.

Mr. DIXEY asked the Home Secretary whether he proposed to introduce legislation to remedy defects in coroners' inquiries in murder cases at an early date.—Sir W. JOYNSON-HICKS replied: Yes, Sir.

Further Accommodation for London University.

Dr. LITTLE asked the Secretary to the Treasury whether the Senate of the University of London had declined the offer of April, 1920, made by the then President of the Board of Education, of the Bloomsbury site; and whether the Treasury was prepared to entertain alternative proposals for increasing the present accommodation at South Kensington for the central offices of the University.—Mr. W. GUINNESS replied: The answer to the first part of the question is in the affirmative. In reply to the second part the Treasury have already informed the Senate of their willingness to consider any practicable alternative proposal for an increase, without undue cost, of the accommodation for the central offices of the University which the Senate feel able to suggest.

Export of Morphia to China.

Mr. SCRYMGEOUR asked the Secretary to the Treasury whether he was aware that packets of morphia, bearing the labels of three different London firms—namely, J. A. Wink and Company, manufacturing chemists, Battersea, P. Nicolaidi, and T. and H. Smith, Limited, 25, Christopher-street—were being exported for the purpose of being smuggled into China; and what steps were being taken in the matter.—Sir W. JOYNSON-HICKS replied: The answer is in the negative. The two first-named firms are not licensed to

manufacture or deal in morphine and no licences for the export of morphine are granted them. In the case of the last-named firm, who are manufacturers of morphine, export licences would only be granted if my department is satisfied that the drug is required for medical or scientific purposes, but I think it is only right to say, in view of the fact that the firm's name is mentioned in the question, that I am not aware of any evidence to suggest that they have taken part in or connived at attempts to smuggle the drug into China or elsewhere. The hon. Member is probably aware that it is a common trick of the illicit dealers to put forged labels bearing the names of well-known firms on their wares.

Telephones and Rural Medical Service.

The House went into Committee of Supply on a vote of £32,958,000 for the salaries and expenses of the Post Office, including telegraphs and telephones, Captain FITZROY (Deputy Chairman of Committees) in the chair.

Mr. MACPHERSON said he was speaking for the whole of the Highlands where there were houses and small communities 20, 30, or 40 miles from the nearest doctor, and there was no possibility of any person who might be taken suddenly ill getting a doctor, or near one, without a telephone. The telegraph offices were closed at night and he knew of case after case of extreme hardship because of the lack of extension of the rural telephone system. He was sure the House would agree to any loss that might be caused by the extension of this system.

Sir R. HAMILTON, the Member for Orkney and Shetland, said that, as the Postmaster-General was aware, a petition had recently been sent to him from the island of Papa Westray which furnished a very good example of the difficulties which people suffered who lived in islands where there was no telephonic communication either with the mainland or the next largest island. Papa Westray was separated from the next largest island by a sound through which ran a strong current and it was dangerous for an open boat to cross at night in the winter. No doctor lived on the island, which had over 150 inhabitants, and it would be of inestimable advantage to them to be able to communicate by telephone with the doctor, not necessarily that the doctor should come across, but in order that he might have a statement of the case which would enable him to send over the telephone instructions as to how the patient should be treated.

Major PRICE said that in a village in North Pembrokeshire the other day two accidents happened within an hour or two. The nearest doctor was eight miles away. The telephone wire was down, as it had been very often. The only means of communication was by way of pony and trap. The patient had to be sent to the county hospital, which was 15 miles away, and there was a lapse of 11 or 12 hours before he could be got there, all of which might have been avoided if the telephone had been available. He urged the Postmaster-General to develop the telephone system so that it might be useful to the whole community, and specially to the rural community.

Mr. BUCHANAN urged the necessity for telephone kiosks, conveniently situated near the homes of the people so that they could use them, say, in connexion with a maternity case.

Lieut.-Colonel HENEAGE joined in the plea for increased telephone facilities and said in many villages at the present time the only way of summoning a doctor was by sending a man on a bicycle for him, with the result that sometimes the doctor was hours late in arriving.

Sir W. MITCHELL-THOMSON (Postmaster-General) said he appreciated as much as any hon. Member the importance of developing rural telephones. New rural exchanges were being opened at the rate of something like 20 per month. But he asked hon. Members not to press him too hard, as he had to consider the question of finance. Until the science of wireless telephony as opposed to wireless telegraphy had developed further he did not think it was practicable to instal wireless communication between the islands. So long as they were confined to wireless telegraphy the cost was out of the question.

TUESDAY, JULY 21ST.

Medical Treatment of Tuberculous Men.

Mr. GILLET asked the Minister of Pensions if instructions had been sent to tuberculosis officers to intimate to their ex-service patients who had been under treatment for periods of from three to six years to get light work; and whether, seeing that some patients who had been so informed were advanced cases of tuberculosis and that with so many unemployed it was impossible for such ex-Service men to secure the light work ordered, he would withdraw these instructions.—Lieut.-Colonel G. F. STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: It would not be competent for the Ministry of Pensions to issue instructions to tuberculosis officers regarding the medical treatment of cases under their care, and no such instructions have been issued.

Sanatorium Treatment for Pensioners.

Mr. LAWSON asked the Minister of Pensions if he would say what was the number of pensioners in receipt of pension at 100 per cent. following a course of sanatorium treatment; and whether he would consider the desirability of granting the special rate of 100 per cent. to all men discharged from sanatoria irrespective of its being a first, second, or third course of sanatorium treatment.—Lieut.-Colonel G. F. STANLEY replied: About 10,000 men are in receipt of pension at the rate of 100 per cent. in respect of total disablement due to pulmonary tuberculosis; but I regret that I am unable to say how many of these fall under the special arrangement for men who have completed a course of sanatorium treatment. With regard to the second part of the question, my right hon. friend is in agreement with the reply given by his predecessor to a similar question on July 31st, 1924.

Medical News.

THE CONTRIBUTION OF OPTICAL INSTRUMENT MAKERS TO MEDICAL SCIENCE.—In his presidential address, delivered on July 23rd at a luncheon of the British Optical Instrument Manufacturers Association, Mr. F. Twyman, F.R.S., welcomed the most representative gathering of the optical instrument industry which has ever taken place. He dealt in succession with the contributions of this industry to various important sections of national life. Speaking of developments in the microscope, Mr. Twyman said that the series of apochromatic objectives now provided in this country are superior to any made abroad, adding that many who are doing exacting microscopic work are discarding foreign lenses for British. The important British work on filter-passing micro-organisms demanded, he said, accuracy of focusing and rigidity which was not provided by any existing stand, and such a stand had now been evolved in this country. Improvements in illuminating systems were, if anything, more important than those in objectives. The evolution of the dark-ground illuminator, permitting of the use of higher powers, had resulted almost immediately in the acquisition of new knowledge of disease. He mentioned the combined illuminator used in Mr. J. E. Barnard's work in which a high aperture dark-ground illuminator is mounted concentrically with an encircling quartz condenser. While the former secured visibility and was used to locate the micro-organisms, the latter transmitted ultra-violet light and secured an image on the photographic plate. Mr. Twyman pointed out how essential to medical research is an efficient optical industry. British investigators knew the limitations of their apparatus and just what their requirements were. They laid their knowledge and requirements before the instrument-maker and in a short time were supplied with the instruments that enabled them to go forward and obtain results. Most of the instrumental essentials for the recent work of Dr. Gye and Mr. Barnard were, he was glad to say, British, like the work itself.

BEIT FELLOWSHIPS.—At a recent meeting of the trustees of the Beit Memorial Fellowships for Medical Research the appointment of Mr. Edward Wood, M.P., as a trustee was recorded on the minutes. The annual report, read by the hon. secretary, Sir James K. Fowler, notes the appointment of Dr. David Keilin, the first senior fellow to be University Lecturer on Parasitology at Cambridge. Dr. V. D. Allison, while holding a junior fellowship, was appointed Lecturer on Bacteriology at Queen's University, Belfast; Dr. Robert Keith Cannan and Dr. Ethel M. Luce, at the termination of their junior fellowships, were elected to Rockefeller Medical Fellowships tenable in the United States; Mr. Frank Cook, a junior fellow, has been appointed assistant obstetric surgeon to Guy's Hospital; and Dr. John Maurice Campbell, a junior fellow, has been awarded the Radcliffe prize at Oxford. There is still urgent need, the report states, for additional lectureships, assistant professorships, and professorships, so that a future may be in prospect for those who have gone far to commit themselves to a life to be spent in teaching and research.

The following are the names of candidates elected to fellowships, together with an indication of their proposed research:—

Senior Fellowship.—Herbert Davenport Kay.

Fourth Year Fellowships.—Ernest Basil Verney and John Lewis Rosedale.

Junior Fellowships.—George Hardy Eagles, M.D. Toronto. The specific agglutino-genic properties of streptococcus scarlatinae and the possible further specific grouping of haemolytic streptococci occurring in other pathological processes.

Dorothy Mary Needham. (1) A study of the oxidation-reduction potential of various organisms and tissues—e.g., (a) leucocytes in health and disease; (b) comparison of cancer, normal, and embryonic tissue; (c) cells under the influence of ultra-

violet light and sunlight—using the method of micro-injection of oxidation-reduction potential indicators. (2) A continuation of the study of the pancreatic factor inhibitory to lactic acid formation in muscle, the nature of its effect upon carbohydrate metabolism, and its relation to insulin.

Ernest Noble Chamberlain, M.B., Ch.B. (Hons.) Liverp., M.D. Liverp., M.R.C.P. Lond. (1) Effects of the anterior lobe of the pituitary gland on the liver and other organs of the body; (2) investigation of the relation of pituitary and other ductless glands to cholesterol metabolism, including the variations found in the various pathological syndromes of endocrine disorders; (3) studies in the inter-relations of the various ductless glands by experimental production of over-dosage with one member of the series.

Eric Newmarch Allott, M.B., B.Ch. Oxf. The Growth of Bacteria on Artificial Media. To attempt to grow bacteria on purely artificial media, consisting of simple compounds, such as simple sugars, amino-acids, and salts, with a view to studying (a) what compounds or types of compound are indispensable for bacterial growth; (b) the variations in the characters of the bacteria according to the medium in which they are grown.

Francis Charles Kelly, B.Sc. Aberd. To continue research on iodine metabolism, especially the iodine requirements of animals and the influence on nutrition of diets deficient in iodine: (1) Feeding experiments on small animals with varying amounts of iodine added to the diet; (2) estimation of the iodine content of thyroid glands of animals fed on different diets; (3) determination by balance experiments of the influence of iodine on mineral metabolism, and especially the protein metabolism.

Derek Ernest Denny-Brown, B.M., B.Ch. New Zealand. To investigate spastic paralyses, decerebrate rigidity, and allied conditions, more particularly with regard to the influence of the sympathetic nervous system upon them.

Benjamin Stanley Platt, M.Sc. Leeds. The Relationship Existing Between the Formation of Peroxides by Bacteria and Certain of the Phenomena of Immunity. (a) An attempt to determine whether some constituents of bacteriological media promote peroxide formation by bacteria more than others, and, if such exist, whether they have any influence on the course of pneumococcal infections in animals; (b) a study of the interactions between bacterial peroxides and leucocytic oxidases as they affect the life of bacteria.

ROYAL SOCIETY OF MEDICINE.—The annual report of Council presented to the general meeting of Fellows on July 1st shows a membership of over 4000, being 400 more than in the first year of war. Over 3000 books have been added each year to the library, which was frequented in the last 12 months by 20,000 readers. In 1914 9000 books were borrowed, and last year 13,000. At the annual meeting the treasurers reported the finances to be in a strong position. A committee is at present engaged in studying further developments in the printing and publishing of the Proceedings.

The House of the Royal Society of Medicine will be closed during the whole of August for cleaning and repairs.

ACCUMULATED FUNDS OF APPROVED SOCIETIES: DEPUTATION TO THE MINISTER OF HEALTH.—Mr. Neville Chamberlain received on July 20th a deputation representing, amongst others, the following bodies: Hearts of Oak Benefit Society, National Association of Employees' Approved Society, National Conference of Friendly Societies, National Conference of Industrial Assurance Approved Societies, National Deposit Friendly Society, National Union of Railwaymen Approved Society, Rural Workers Approved Society.

Mr. Meller, M.P., Mr. Oakley, M.P., and Mr. Blundell, M.P., and Sir Thomas Neill, who spoke for the approved societies, said that suggestions had been made in the press and in Parliament that part of the burden imposed on industry by the Contributory Pensions Bill could and should be removed either by taking money from the accumulated funds of approved societies or by lowering the contributions. The argument was that the size of the funds that had accumulated indicated that the difference between the income and expenditure was far larger than was required by the needs of the case, and that the insured person would readily agree to any reduction in the benefits that he might receive in exchange for a lessening of the contribution which he, in common with his employer, must pay. Their answer to this argument was that the funds that had accumulated were held in trust for the insured person, by whom, or on whose behalf, they had been paid, and that the possibility of paying additional benefits which had been provided for in the original Act and on the basis of which a number of societies had been formed for those occupations in which sickness incidence was small was a fundamental part of the scheme. They were anxious to receive an assurance from the Minister that he had not been shaken by the widespread attempt that was being made to tamper with the funds of approved societies.

The Minister, in reply, promised to deal with this matter on the third reading. Until what they described as "the attack" had been developed, he could not predict to them what line he would have to take in meeting it, but he could inform them that he was well aware of certain fundamental considerations, such as that the fund from which it was proposed to draw money for the relief of industry was not an aggregate fund, but merely the sum of a number

of separate funds belonging to different approved societies. Nor, on the other hand, had those who were suggesting either of these methods of relief indicated what the starting-point was to be—whether the additional benefits given as a result of the first valuation or as a result of the second valuation were to be treated as inviolable. The only assurance that in the nature of things it was possible for him to give them at the present moment was that he would be a party to nothing which would endanger the solvency of societies or involve breach of pledges given by successive Governments.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—At the thirty-eighth meeting of the Commission, besides those already mentioned, evidence was given by the Joint Tuberculosis Council, represented by Sir Henry Gauvain and Dr. G. Lissant Cox, on the need for amendment in the treatment and cash benefits of insured persons suffering from tuberculosis. Mr. Walter Farris was examined on his scheme for fundamental alterations in the financial structure of the scheme.—The thirty-ninth meeting of the Commission was held at the Home Office, Whitehall, on July 14th, Prof. Alexander Gray in the chair. Evidence dealing with the constitution of the Central Fund, the methods of audit of approved society accounts, the accumulation of cash benefits in respect of persons in institutions, and the provision of dental benefit was submitted by Mr. William McLean on behalf of the Grand United Order of Oddfellows Friendly Society. The United Patriots National Benefit Society, represented by Mr. J. M. Roberts, gave evidence recommending the provision of curative treatment at the British spas as a benefit for members of approved societies suffering from rheumatic diseases, this evidence being supported by Dr. Fortescue Fox, past President of the International Society of Medical Hydrology, and Mr. John Hatton, secretary of the British Spas Federation. Thereafter Miss M. A. Hilbery gave evidence as to delays and irregularities in payments of cash benefits.—The fortieth meeting of the Commission was held at the same place on July 16th, Lord Lawrence of Kingsgate in the chair. Evidence was given by Mr. H. Lesser, on behalf of the London Insurance Committee, as to the powers and duties of the Committee and methods of improving the medical benefit service. Mrs. Hubback, representing the National Union of Societies for Equal Citizenship, put forward proposals for improving the position of women under the Act. The Standing Joint Committee of Industrial Women's Organisations, represented by Dr. Marion Phillips, submitted recommendations for extending medical benefit to dependants and widening its scope, for increasing the cash benefits, and for pooling the surpluses of approved societies. Thereafter Mr. W. A. Middleton, acting chief auditor of the National Insurance Audit Department, described the detailed arrangements for audit of the accounts of approved societies and insurance committees.

CANADIAN MEDICAL ASSOCIATION: ANNUAL MEETING AT REGINA.—Delegates from the British, American, and Chinese medical associations were present at the fifty-sixth annual meeting of the Canadian Medical Association held in Regina, Saskatchewan, under the presidency of Dr. David Low (Regina) in the first week of July. A grant of \$30,000 (£6000) offered by the Sun Life Assurance Company of Canada to carry on post-graduate extension lecture courses throughout the Dominion was accepted by the Association. The organisation will be directed mainly towards helping the medical man in rural areas to keep abreast of medical advance of medicine. The report on medical education submitted by Dr. D. J. McLean (Winnipeg) emphasised the need for turning out practitioners qualified to render public service, rather than purely scientific men. Dr. T. C. Routley (Toronto), secretary of the Association, announced the opening of negotiations with the Royal College of Surgeons of England for the admission of Canadian medical graduates to membership of the College on easier terms. Dr. M. M. Seymour (deputy Minister of Health for Saskatchewan) foretold the time when communicable diseases would cease to menace mankind. Dr. Forest Leader (Victoria, B.C.) was chosen as president-elect for 1926-27, Dr. A. Primrose (Toronto) as chairman of Council, and Dr. A. T. Bazin (Montreal) as treasurer. Dr. Routley continues to hold office as general secretary. The executive committee is constituted as follows: Dr. David Low, Dr. Forest Leader, Dr. A. T. Bazin, Dr. T. C. Routley, Dr. W. G. Reilly (Montreal), Dr. G. S. Cameron (Peterboro, Ont.), Dr. T. Glenn Hamilton (Winnipeg), Dr. C. F. Martin (Montreal), Dr. J. G. Fitzgerald (Toronto), Dr. G. S. Young (Toronto), Dr. J. S. McEachern (Calgary), Dr. G. S. Seymour (Regina), Dr. F. N. G. Starr (Toronto), and Dr. S. L. Walker (Halifax). Dr. A. D. Blackader (Montreal) was reappointed editor of the *Canadian Medical Association Journal*, with Dr. Bazin as managing editor. Dr. W. H. McGuffin (Calgary) was chosen as president of the Canadian Radiology Society, and Dr. G. C. Brooks (Montreal) continues to act as secretary-treasurer. Victoria, British Columbia, will be the place of meeting in 1926, and the Canadian Radiology Society will meet at the same time and place.

THE King has appointed Sir Thomas J. Horder, Bart., a Knight Commander of the Royal Victorian Order.

CLIMATOLOGICAL CONGRESS AT DAVOS.—The Congress organised by the Davos Institute for Alpine Physiology and Tuberculosis Research will be held, as already announced, from August 16th to 22nd. The programme includes nearly 50 papers and demonstrations distributed among four sections: General, physical-meteorological, biological, and clinical. Dr. Carrière, head of the Swiss Public Health Department, will open the Congress with an address on the Relationship between the Various Climates of Switzerland and the Health of the Population. In the same section Dr. R. King Brown (London) will speak on the Climate of a Big City, and other speakers will include Prof. Dietrich (Berlin), Prof. Hellpach (Karlsruhe), Prof. Levi (Rome), and Dr. Wehrli (Zurich). In the clinical section Dr. Leonard Hill and Sir Henry Gauvain are announced to speak. Membership cards at a cost of 20 (Swiss) francs may be obtained on application at the Davos Research Institute, members being entitled to reduced railway fares and special terms for hotel accommodation.

AMSTERDAM INDUSTRIAL CONGRESS.—The Fourth International Medical Congress of Industrial Accidents and Diseases will take place in Amsterdam from Sept. 5th to 12th next, opening at 3 P.M. on Saturday, Sept. 5th, when the national exhibition will be inaugurated. On Monday, at 2.30 P.M., the ceremonial opening of the Congress takes place, followed by a banquet to the official representatives. At the plenary session on Tuesday morning, Prof. B. Cuneo (France), Dr. L. Teleky (Germany), Prof. J. Glaister (England), Dr. L. Heijermans (Holland), and Dr. F. Zollinger (Switzerland) will take part. Afterwards the Congress breaks up into collateral sections of industrial accident and industrial disease, in each of which papers will be read covering a wide range of subjects. At the plenary session to be held at The Hague on Saturday, Sept. 12th, Dr. Allers (Austria), Sir Thomas Oliver (England), Prof. L. Devoto (Italy), and Dr. A. Oller (Spain) will take part. The programme and further information may be obtained in this country from Dr. H. Menko, hon. sec. to the British Executive Committee, at 2, Grosvenor-gardens, London, N.W. 2.

THE LATE DR. G. S. SIMS.—George Samuel Sims, who died recently at Derby at the age of 70, qualified in 1884 with the L.S.A., having been educated at Owens College, Manchester, and at St. Thomas's Hospital, London. Four years later he obtained the M.R.C.S. and L.R.C.P. Lond. and graduated M.D. Durh. in 1900. For more than 30 years he was district medical officer to the Derby Board of Guardians and for nearly as many medical officer to the Liversage Charity. He was at one time President of the Derby Medical Society. At the outbreak of war, in spite of his age, he volunteered for service with the R.A.M.C., and did valuable work both at home and abroad. His surviving sons, Dr. G. H. Sims and Dr. T. H. Sims, both follow their father's profession.

FACULTY OF MEDICINE, VIENNA.—The Dean of Vienna University announces the following forthcoming courses: (1) Eighteenth International Advanced Course for Practitioners, Sept. 14th to 26th inclusive, covering the most important medical problems of to-day. (2) Practical Training Course for Students, Sept. 25th to Oct. 2nd inclusive. Applicants should send names, titles, and addresses in writing to Dr. A. Kronfeld, Sekretär der Internationalen Fortbildungskursus, Wien IX., Porzellangasse 22. (3) International Advanced Course in Dermatology and Syphilis, Nov. 23rd to Dec. 6th. Apply Dr. Kronfeld. (4) Special General Courses and Group Courses every month. Apply Das Bureau der Wiener Arztekurse, Wien VIII., Schloßelgasse 22. The Society for the Study of Digestive and Metabolic Diseases are also meeting from Sept. 30th to Oct. 3rd. Inquiries to Prof. Dr. Fuld, Berlin W. 15, or to Dozent Dr. Lugen, Wien XI., Alserstrasse 4 (Klinik Orther).

MANCHESTER BABIES' HOSPITAL.—The medical report for 1924 shows that 223 children were in the hospital during the year, the average period spent there being 54 days for all cases and 36.7 days for fatal cases. There were 36 deaths, of which 16 were due to pneumonia, 11 to dyspepsia, 3 to tuberculosis, 2 each to status lymphaticus and congenital heart disease, and 1 each to cerebral abscess and congenital syphilis. Two deaths took place within 48 hours of admission. Research on the use of oxygen administration in the treatment of atrophic infants has been continued, the results having warranted the provision of a third special cot. The new buildings were practically finished when the report was written. The new wards include sun parlours and verandahs opening into the garden on the south side. Not only can 80 babies be taken, instead of 50 as hitherto, but the X ray, massage, and mercury-vapour lamp departments, which have been handicapped by seriously cramped conditions, will now be able to work in their own special quarters, to the benefit of both patients and staff.

THE SALVATION ARMY MOTHERS' HOSPITAL EXTENSION.—The new buildings of this institution at Lower Clapton-road were opened by the Queen on July 16th, among those presented to Her Majesty being Lady Barrett, who is head of the medical staff. The hospital additions include two new bungalow blocks, which increase the accommodation from 60 to 90 beds. These blocks are models of sunny spaciousness, the approaches and adjuncts being built with an eye to the mothers' comfort and convenience and to the staff's fullest efficiency. Another important new feature is a specially designed and fully-equipped operating theatre—a feature the hospital has hitherto lacked and has greatly needed. Other departments of the hospital have been renovated and re-decorated, the total cost being £17,500.

PROFESSIONAL AND BUSINESS WOMEN'S HOSPITAL LEAGUE.—The annual report for the year ending Dec. 31st, 1924, states that 548 new members (50 of them students) joined during the year, making the total number 2008. The schedule of sickness and disease recognised by the League includes all cases which a general hospital will admit, and excludes mental illness, infectious disease, rest cures, and cases not sufficiently serious to be admitted to hospital. The ordinary benefits available are: 1. Four weeks' treatment in a hospital specified by the committee, either in London or in the provinces. 2. Free consultation with a gynaecologist, should this be necessary. 3. A reduction of cost on surgical instruments. Grants have been given for massage, X ray treatment, surgical splints, and help towards the cost of instruments. Up to the present it has been found impossible to give grants for specialists' fees. The subscription is now 7s. 6d. a year, and every member receives a numbered membership card. During the year 32 members underwent treatment at hospitals in London, 11 in the provinces; grants were made to 42 others. Fourteen applications were refused, 7 were considered ineligible, and 11 were withdrawn. The Secretary of the League is Miss P. Strachey, at 35-37, Marsham-street, Westminster, S.W. 1.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, July 27th, to Friday, July 31st.—**WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W.** A Special Course of Lectures, including clinical demonstrations upon selected cases, will be given at the Hospital at 5 P.M. as follows: Monday, Dr. Carnegie Dickson on The Pathology of the Cerebro-Spinal Fluid; Tuesday, Dr. Hildred Carlill on Lesions of the Cranial Nerves; Wednesday, Mr. Lindsay Rea on Ocular Manifestations of Nervous Disease; Thursday, The Registrar on Common Neuroses; and Friday, Dr. C. Wooster-Drought on Clinical Forms of Neuro-syphilis.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 27th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Donald Arnour: Operations.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 2 P.M., Mr. Addison: Operations. 3 P.M., Dr. Pritchard: Medical Wards.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients.

THURSDAY.—11 A.M., Sir Henry Simson: Gynaecological Wards. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—10.30 A.M., Dr. Dowling: Skin Dept. 12 noon, Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY, August 1st.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations of the Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

HAMILTON, W., M.B., Ch.B. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Loanhead District of the County of Edinburgh.

Queen Charlotte's Maternity Hospital, Marylebone-road: **LANKESTER, A. L., M.R.C.S., L.R.C.P. Lond.,** Assistant Resident Medical Officer.

Royal Chest Hospital, City-road, E.C.: **GREENSLADE, C. M., M.B., Ch.B. N.Z., F.R.C.S.,** **WILLIAMS, H. LESTER, M.B., Ch.B., F.R.C.S.,** Assistant Surgical Officers; and **KERLEY, PETER, M.B.,** Radiologist.

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Sen. Res. Surg. £330. Jun. Res. Surg. £300.

Barnsley and Wakefield Joint Sanatorium.—Asst. Tub. O., &c. £450.

Birmingham Cripples' Union and Royal Orthopedic and Spinal Hospital.—Jun. H.S. £150.

Bournemouth, Royal Victoria & West Hants Hospital.—Hon. Med. Clin. Asst., Surg. Clin. Asst., Ophth. Clin. Asst. Also Hon. Asst. S. and Hon. Asst. P.

Brigholm, Lady Chichester Hospital.—H.P.

Brigholm, New Sussex Hospital.—Temporary Dental Surgeon.

Bristol, Cosham Memorial Hospital, Kingswood.—Res. M.O. £150.

Cairo, School of Dental Surgery.—Supt. and Lecturer in Metal-lurgy, &c. £E.900. Lecturer in Surg. £E.480. Asst. Lecturer in Surgery. £E.360. Lecturer in Mechanics. £E.480.

Cumberland and Westmorland Mental Hospital, Carlisle.—Jun. Asst. M.O. £350.

Hertford County Sanatorium, Ware Park, near Ware.—Asst. M.O. £350.

Hong Kong University.—Reader in Biology. £600.

Liverpool County Borough.—Jun. Asst. Sch. M.O. £600.

Liverpool, Royal Children's Hospital.—Two Res. H.P.'s and Two Res. H.S.'s. Each at rate of £60.

Liverpool University.—Professor of Entomology. £800.

London Hospital, E.—First Asst. and Reg. £200 for six months.

London School of Hygiene and Tropical Medicine.—Lecturer on Tropical Hygiene. 200 guineas.

Manchester, Ancels Hospital.—Pathological Registrar. £100.

Manchester Royal Infirmary.—Second Surg. Reg. £150.

Ministry of Pensions.—Part-time Surgical Supervisor of Orthopedic Clinics. £500.

Mount Vernon Hospital, Northwood, Middlesex.—Surg. Laryngo-logist.

Pictmaritzburg, Grey's Hospital.—Male H.S. £500.

Rochester, St. Bartholomew's Hospital.—H.P. at rate of £200.

Royal Chest Hospital, City-road, E.C.—Asst. Tub. O. £550.

Royal Northern Hospital, Holloway, N.—Anaesth. £10 10s.

Salford Royal Hospital.—Radiologist. £300.

Samaritan Free Hospital for Women.—H.S. at rate of £100.

Staffordshire Mental Hospital, Cheddleton, Leek.—Jun. Asst. M.O. £350.

Sudan Government, Wellcome Tropical Research Labs., Khartoum.—Asst. Bacteriologist. £720.

Willesden General Hospital.—Hon. Anaesth.

Worcester General Infirmary.—Jun. Res. M.O. £120.

Births, Marriages, and Deaths.

BIRTHS.

ANDREWS.—On July 19th, at 152, Harley-street, W. 1, to Helen, wife of J. Alban Andrews, M.C., F.R.C.S.—a daughter.

DICKSON.—On July 21st, the wife of W. Muir Dickson, F.R.C.S., of a daughter.

LOCK.—On July 17th, at Glyngarth, Soho-hill, Birmingham, the wife of J. Lewis Lock, M.A., M.B., of a daughter.

MOODIE.—On July 15th, the wife of Dr. William Moodie, of Horton, Epsom, of a daughter.

NORMAN SMITH.—At "Stone Field" Maternity Nursing Home, Kidbrook Crone, Blackheath, on July 15th, to Molly (née Terraine), wife of Dr. Norman F. Smith (Khartoum), the gift of a daughter.

RAVEN.—On July 11th, at Victoria-parade, Broadstairs, the wife of Martin O. Raven, M.D., of a daughter.

WATSON.—On July 18th, at Del Rey House, Cheltenham, the wife of Lieut.-Colonel C. H. Watson, D.S.O., I.M.S. (retd.), of a daughter.

MARRIAGES.

STUTTAFORD—ROYDEN.—On July 16th, at the Parish Church, Flegg Burgh, Norfolk, W. J. E. Stuttaford, M.C., M.R.C.S., L.R.C.P., to Marjorie, only daughter of Dr. and Mrs. Royden, of Flegg Burgh.

WAKELEY—NICHOLSON-SMITH.—On July 21st, at St. Margaret's Church, Lee, S.E., Cecil P. G. Wakeley, F.R.C.S., of 5, Devonshire-place, W., to Elizabeth Muriel, only daughter of Mr. and Mrs. James Nicholson-Smith, of Blackheath.

DEATHS.

BEDDARD.—On July 14th, Frank Evers Beddard, D.Sc., F.R.S.

DUNCAN.—On July 15th, at Margate, Horace Duncan, B.A. Camb., M.B. Lond., son of the late James Duncan, M.D., of Henrietta-street, Covent Garden, London, in his 64th year.

EVANS.—On July 18th, at Danygraig, Burry Port, Surg.-Lieut.-Colonel Evan Evans, T.B., M.B., F.R.C.S., D.P.H., of Llanelly, in his 72nd year.

FRY.—On July 14th, at his residence, Old Town, Clapham Common, John Marchant Fry, L.R.C.P. Lond., in his 62nd year.

HENDRIKS.—On July 17th, at Bicester, Cecil Morgan Hendriks, O.B.E., M.B., M.R.C.S., in his 70th year.

WILLIAMS.—On July 13th, at Colwyn Bay, W. M. Venables Williams, L.R.C.P., L.R.C.S., D.P.H., J.P., in his 68th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts

INFECTION BY BOOKS.

By J. E. MCCARTNEY, M.D., D.Sc. EDIN.,
DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES,
METROPOLITAN ASYLUMS BOARD.

THE method of spread of infectious disease is a subject of great importance, particularly from the point of view of prevention, and in order to ensure that an epidemic shall be properly controlled all the various methods of its dissemination must be considered.

Owing to the lack of knowledge of the biology of the causal agents of certain infectious diseases it is very difficult, if not impossible in many cases, to state whether the infective agent is present in an active state or not. It is obvious that the answer to such a question is of supreme importance, for if the virus is active then vigorous steps must be taken for its destruction, whereas if the causal agent of the disease is inactive then there is no danger of the infection spreading.

The Problem.

A possible means of spread of infectious disease is by means of books—particularly library books. Briefly, the problem is as follows: A book has been borrowed from a public library and is taken to a house in which infectious disease is either present at the time or occurs while the book is there. The book, which may or may not be read by the patient, is returned to the library and is almost immediately taken out by another person to a house in which some of the inmates are susceptible. Is there a danger of infectious disease being carried from the one house to the other by means of the book? If books do carry infection then the possibility of spread of infectious disease may be great owing to the wide circulation which a public library enjoys. The precautions necessary for the prevention of such a means of spread must be thorough, involving the expenditure of much time and money. If, on the other hand, the chances of spread of infection are minimal, then the energies of those responsible for the control of disease can be expended more profitably in closing the known avenues of spread.

Various Possible Infections.

Of the infectious diseases *small-pox* must be considered separately owing to its virulent nature. Some observers have recorded instances where it would appear that *small-pox* has been conveyed by books and by letters, but this method of spread has not been conclusively proved. Although the virus of *small-pox* is comparatively short-lived outside the body, yet the amount of virulent material necessary for infection is extremely small, and while the chances of disseminating *small-pox* by means of books are not great, yet we must assume, in the absence of definite information, that there is always the possibility of such spread. This information could only be obtained by extended human experiment, which is, of course, out of the question.

Owing to the virulent nature of the disease and the dire consequences of its spread, no risks whatever can be taken with *small-pox*, and in the light of our present knowledge all books, letters, papers, &c., must be considered as potential means of conveyance of *small-pox* infection and should be rigorously destroyed.

With regard to exanthematous diseases such as *measles*, *rubella*, and *chicken-pox*, our knowledge of the nature of the infective agents is extremely scanty. The biology of these viruses is unknown and their period of survival outside the body can only be conjectured. It is not possible to transmit any of these diseases to animals, and in consequence experimental work is out of the question, and precise facts as to infectivity could only be obtained by carefully controlled investigations on the human subject. It is known, however, from clinical observations that these viruses are extremely short-lived outside the body, and their period of infectivity under these conditions is probably only a few hours. It is also known that the virus, in the case of *measles* and *rubella*, is present in the naso-pharyngeal secretions, and in order definitely to infect a book, the patient would have to be in the early stages of the disease and to cough or sneeze thoroughly into its pages. From our available knowledge it would appear that even if the book were infected with virulent material, the viruses would die out in a comparatively small time, and that the chance of spread of infection by this means is remote. No definite evidence has been produced, as far as we know, that *measles*, *rubella*, or *chicken-pox* has been transmitted through the agency of books.

Scarlet fever, though an infectious disease, is nothing like so infectious as *measles*. The naso-pharyngeal secretion is infective, and the causal agent may be disseminated by

coughing and sneezing. If the aetiological agent of the disease is as recent work would indicate, the streptococcus, then it is known that this organism will survive drying only for a short time, and even if found viable outside the body, may not necessarily be virulent.

Investigations could be made on the period of survival of the streptococcus in infected books, and the length of time the organism is viable under the conditions under discussion could be ascertained.

In *diphtheria* the causal organism is known and its period of survival outside the body has been determined. Dried *diphtheria* membrane kept in the absence of light has been found to contain living virulent bacilli after several months, but that the organism would survive for that length of time under the usual conditions in which a book becomes infective is doubtful. The fact remains that books have not been definitely proved as a source of transmission of *diphtheria*, and if transmission does occur it is difficult to prove.

Limits of Our Knowledge.

There are numerous methods of spread of infectious disease, many of which we do not know, and a possible means is not necessarily the probable one.

The question of spread of infection by books was recently discussed by the Society of Medical Officers of Health.¹ The general opinion was that there was no knowledge that infection was conveyed through books, but in the light of uncertainty definite measures should still be taken to prevent the possibility of spread of infection.

This summary indicates the view that must be taken in consideration of the meagre knowledge we possess regarding the spread of infectious disease. Apart from *small-pox*, the chance of infection by books is extremely small, but the medical officer should take no risks and should deal with the books as if they were infectious. In conclusion, it may be stated that it is extremely improbable that library books play an active part in the dissemination of infectious disease.

HEALTH AND HOMECROFTING.

THE close connexion which exists between the food of the people and the public health gives a scheme of homecrofting put forward by Prof. J. W. Scott an important medical aspect. The scheme has been clearly explained in a recent booklet.² Opportunity has now arisen for putting it to a practical test on the outskirts of Cheltenham; and Mr. J. St. Loe Strachey in the *Spectator* of July 11th has given the project his wholehearted support.

Homecrofting is in essence organised allotment gardening where each artisan dwelling has attached to it about one-third of an acre of land. At first the way to cultivate the land is taught by a skilled overseer, but each tenant should soon by his own labour be able to become independent of the greengrocer. The scheme plans for older school-children to be sent in rotation every third week to be taught homecrofting; how to prepare and manure the land; what succession of crops to sow; how to keep and feed rabbits, fowls, goats, and perchance a pig. Each time they return they would see the progress since they left and so be able to appreciate the value of their work. Thus a future generation would be educated for becoming scientific homecrofters, practising "subsistence agriculture," instead of being merely industrial consumers of food imported from abroad.

"Homecrofting," writes Prof. Scott, "is the art of making your own food with your own hands, so that you do not need to buy it. The suggestion is, take advantage of the short industrial hours. Aim at two shifts a day for the man: one shift at industrial work, earning wages, and another shorter shift, with his wife and children in his garden, producing food."

"A final way of escape from hunger. Wherever you have that you have a solution of the unemployment problem. That is what the homecroft plan tries to present."

In these days of short working hours and unemployment this scheme presents an ideal method for filling up leisure time. No form of recreation is healthier or more interesting than gardening. No vegetables ever taste so good as your own; no eggs are ever so fresh. Nevertheless, the plan is put forward, in the main, not for health purposes, but for economic and social reasons.

The first trial is to be on 18 acres, if the needed capital, £2500, can be raised. As the money will be invested in land and cottages, contributors, even if the experiment fail totally, will not lose all they invest. It is a worthy attempt to do something to rectify present social and industrial difficulties. The *Spectator* undertakes to receive and pass on any subscriptions and is offering prizes to the best homecrofters.

¹ Public Health, 1923-24, xxxvii., 265, 295, 296.

² Unemployment: A Suggested Policy. By J. W. Scott. London: A. and C. Black. 1s.

An Address

ON

PERSONALITY, MAGIC, AND MEDICINE.

*Delivered before the University of Edinburgh at the
Graduation Ceremony, July 24th, 1925.*

By GEORGE M. ROBERTSON, M.D.,
F.R.C.P. EDIN.,

PROFESSOR OF PSYCHIATRY IN THE UNIVERSITY OF EDINBURGH.

VICE-CHANCELLOR.—My first duty is a very pleasant one. It is to congratulate those who have to-day achieved the high honour of becoming graduates of this University. In a short time many will be engaged in practising medicine, and others will have scattered to distant parts of our wide Empire. In the name of the University, I wish you all God-speed! Your course of professional study has been a long and arduous one, and during it you "scorned delights and lived laborious days." Do not take this too literally, for Promoters, like poets, enjoy a certain licence. I have no doubt that many of you, without detriment to your studies, have found time "to sport with Amaryllis in the shade." Gone, alas! are "the tangles of Neera's hair." Since Milton wrote these lines fashions have changed.

EXAMINATIONS AND PERSONALITY.

You have all known what it is to suffer under the dark shadow of professional examinations. Such anxiety is a deadly poison to intellectual effort, but you have found an antidote in the magic of the Vice-Chancellor's touch, and of the cabalistic words which he has pronounced over every graduate. These graduation rites, however, are much inferior in picturesqueness and romance to those of a bygone age. A thousand years ago, at the famous medical school of Salerno, the Chancellor, or Rector, placed a crown of laurel on the brows of the successful graduate. Then he placed a ring on the graduate's finger. And finally, to mark the climax of the proceedings, the learned professors kissed the graduate. Even in those far-off days there were lady medicals!

No one has a good word to say about examinations. They are disliked by the professor who examines only less than by the student who is examined. They seem to be a sort of old-man-of-the-sea, of Chinese descent, who has fastened himself on the shoulders of our academic life. The Chancellor of the University, Lord Balfour, calls them "soul-killing institutions, bad for the teacher and bad for the taught." Now, if they are absolutely necessary in order to test your fitness for the practice of medicine, is it not strange that no test is applied to that which is the master-key to success as a physician—namely, "personality?" It is difficult to say what this personality is.

Personality is described by some in poetical language as personal magnetism. By others it is regarded as a miraculous gift of divine origin, the gift of healing. We are assured on the testimony of good people, like bishops, that there are persons, quite unequipped with any medical knowledge, indeed one might correctly say unhampered by any medical knowledge, who work miracles of healing. Such gifted beings are called "healers" in order to differentiate them from medical men fashioned of common clay, whose little learning has been laboriously acquired, and whose power of healing, unlike theirs, is subject to definite limitations. The difference in the methods employed by the healer and by the doctor is that which exists between magic and science. As the philosophy of healing is obscure let us investigate for a few minutes the problems

connected with magic and medicine, giving, of course, the place of honour to magic, by right of seniority.

There is no Chair of Magic in the University of Edinburgh. This is most unfortunate, because, a knowledge of the history of magic helps us to understand the development of the human mind and also of science. Who can tell what chemistry owes to the search for the Philosopher's Stone—and pharmacology to the pursuit of the Elixir of Life? The Earl of Gowrie, who was killed in 1600, studied magic at Padua, but whether he did so in intra-mural or extra-mural classes we are not told. Sir Walter Scott, however, informs us that at the University of Toledo there was a Chair of Necromancy. Although there is no special Chair of Magic in Edinburgh, this important subject probably survives in one or another of the existing chairs. In the Faculty of Arts, the Chair of Natural Philosophy includes much that would have been regarded at one time as magic. Consider the applications of electricity alone. Last year when Wembley was opened thousands of persons in Princes-street Gardens heard a voice from the clouds repeating the Lord's Prayer, and then another voice, that of the King, addressing the people. Had King James VI., who founded this University, been present on this occasion, he would most certainly have regarded these as manifestations of a magical character, for he held strong views on witches and witchcraft.

MAGIC IN THE MEDICAL CLINIC.

In the Faculty of Medicine magic under a disguise is to be found. The preservation of life by insulin and the painless sleep of chloroform are in a sense magical. The protection from typhoid of millions of our fighting men during the war was in a sense as magical as the action of Moses when he made a serpent of brass, and it came to pass that all who beheld the serpent lived. Magic consists not only in the performance of rites invoking occult agencies, not only in the employment of materials possessing supernatural power and virtue, but also in a certain habit or attitude of mind towards inexplicable phenomena. Now, there exists to-day a curious and most amazing difference in the way that people have of looking, on the one hand, at phenomena of a physical kind, and on the other, at phenomena connected with the treatment of disease, a distinction actually fostered by the Church. No educated person now believes that the applications of physics are magical. They merely illustrate the progressive unveiling of the forces of nature and their subjugation to the uses of mankind. But it is not so with regard to the employment of remedies in disease. The element of magic in this sphere has never disappeared. No theory of disease is too fantastic, no line of treatment too futile to be accepted even by the most cultured. The sick person has some excuse for his actions and beliefs as he is never at his best; he is always off colour. He is more emotional and more suggestible. He is an easy prey to fears of ill-health, and he clutches eagerly at any remedy that chance brings within his reach. His mind is in an ideal condition to be worked on by magic. In colloquial language, "he is simply asking for it."

Let us see how readily the symptoms of disease lend themselves to treatment by magical methods. However unpleasant symptoms may be to the patient, almost all pass away naturally in course of time. And, if we exclude physical conditions, such as broken bones, we find that symptoms are almost exclusively mental. Pain is the basis of every symptom; malaise and discomfort are merely lesser varieties of it. And pain is a simple state of mind, just like the sensation of colour. It seems to be felt in a particular region of the body, just as colour seems to be the property of an external object, but both the sensation of pain and the sensation of colour are experienced within the brain and in the mind. Because of this localisation of

sensation within the brain, pain may still seem to be felt in the foot, although the whole leg has been amputated.

Pain is sometimes called real and sometimes imaginary, but to the patient both forms are real and both forms are amenable to treatment by mental suggestion, whether magical or otherwise. Toothache, for example, due to an organic cause, such as the decay of a tooth, is of course "real" pain, as we can all vouch for, yet it sometimes happens that when the hand of a patient suffering from toothache touches the dentist's front door bell all pain suddenly vanishes. Suppose now that a patient desires treatment of a magical kind. He may go to a Christian Scientist or to a Spiritual Healer; he may consult a plausible charlatan; or he may seek the vendor of a secret nostrum. In many cases he will benefit: and why not? The majority of symptoms pass away spontaneously; the treatment he receives is mental and therefore suits the symptoms exactly; mystery is invoked and this appeals to the superstitious elements lying latent in the patient's mind; and lastly, the patient comes with a child-like faith in the treatment for which he asks. As honest seekers after the truth we must face these facts. Look at Christian Science and its incredible development in America. It is a very simple therapeutic system, from which diagnosis is excluded, and it employs one remedy. Painfully inadequate as it seems to us, it has succeeded in founding cathedrals and in comforting millions. It has built 74 churches in this country and hundreds in America. Would that some of the money thus subscribed by grateful patients had found its way into the empty coffers of this University! Why do we not receive this grateful help? Is it because we have concerted healing into a cold science instead of leaving it an impressive mystery and a passionate faith? For it has passed through those phases. Have we like Martha been careful and troubled about many things, material, but missed the one thing, psychic, that is needful? Men and women hunger after the mystic and the wonderful; they are just big children in matters connected with illness; and their craving for miraculous cures will not cease till the progress of the science of medicine has rendered such cures superfluous.

The patient may consult a regular practitioner of medicine, and what follows? Almost inevitably the doctor will prescribe certain vegetable or mineral products, and the patient will derive benefit from his prescription. Is this almost exclusive reliance on the physical action of drugs, when we know to what an extent symptoms are mental, either logical or scientific? How much of it is due to a mere desire to gratify the patient's faith in medicine out of a bottle? Or is it unconsciously derived from the pursuit of the "elixir of life"? We all know that traditions die hard, as witness the obsolete prayer to Jupiter, concealed in the symbol that heads our prescriptions. Drugs undoubtedly possess pharmacological actions which are invaluable, as, for example, the effect of quinine in malaria, but symptoms are mainly mental, and medicines largely depend for the benefits they confer on the confidence of the patient in the physician and faith in his prescription. If this be so, then the drug treatment of minor ailments does not differ so very much from those other forms of treatment that consist merely of mental suggestion, though called by another name.

THE POWER OF THE MIND.

What distinguishes the doctor from the healer is his undeviating rationalism. His recognition of the mental element in disease, whether as a cause, as a symptom, or as a cure, is deficient. He has a horror of introducing mystery into his treatment, even though his patients have not yet emerged from the darkness of superstition, and his practice would probably increase if they believed that the letters M.B. after his name indicated that he was a Bachelor of Magic. And he

could always assure for himself and his family a respectable livelihood among the credulous, who form the majority of the population, if we could honestly assert that the letters Ch.B. were conferred upon him because he was a Bachelor of Charlatanism. It is not in the alleviation of symptoms, nor in the treatment of minor ailments, that medicine impresses us. It is in its confident challenge to the diseases that kill that the science of medicine reveals its greatness. Witness the attack on cancer, and the results just obtained by a graduate of this University. What also could be more convincing, what more impressive, than the simple statement that during our life-time the death-rate has fallen from 22 per 1000 to 12, and that the expectation of life has risen from 40 years to 55. The people of this country and of this generation have, through medical science, experienced in their own persons the fulfilment of the promise conveyed by the Prophet Isaiah to the dying Hezekiah: "I have heard thy prayer, I have seen thy tears: I will add to thy days 15 years."

Recoveries are effected by magical methods, by religion, by charlatanism, and by nostrums. The importance of these is not to be minimised because they occur in minor ailments, for once a neurosis or other illness has begun, no one can foretell how serious the end-results may not be. The medium of cure in all these cases is the mind. The body cannot get away from it any more than the body can escape the action of the force of gravitation. Its power is great both as a causative and a curative agent. It can produce organic changes; it can hasten or retard recovery.

At the beginning of the Christian era, the science of medicine was in its infancy among the Jews, who believed that disease was directly inflicted by God or caused by evil spirits. In this, the twentieth century, can science accept such primitive pathology? The sphere of the Church is spiritual and moral; and the clergyman is honoured in every household and welcomed in times of sickness and of sorrow. But the healing of the sick is the sacred trust of the physician, as absolutely so as the study of the heavenly bodies in their courses is the sphere of the astronomer, although Science can never forget that the Church did not concede even this point till Galileo had suffered.

THE MOST VALUABLE ASSET.

In the last place, the most valuable asset of the physician is personality. Its influence in sickness is mental healing, and it is of greatest value when trained and directed. The methods of employing such healing are infinite, for they vary with age and sex, with race and religion, and with circumstances.

Unquestionably, you, who have graduated to-day, are members of the only class fit to be trusted with the exercise of these great powers of healing. Your Alma Mater relies upon you because she knows that you possess a knowledge of the science of medicine, and because you follow the highest ideals of professional conduct. The superstitious and the ignorant are drawn, as by a magnet, into the pitfall of charlatanism.

Although you have passed no professional examination on this subject, you all have within you a psychic influence more powerful to relieve and more helpful in sickness than all the drugs in the British Pharmacopoeia. This magical force is personality. It is this possession that makes medicine greater than a science: Go forth and use it wisely!

THE LATE DR. J. T. WILLIAMS.—The death occurred on July 16th at Barrow-in-Furness of John Terrell Williams, M.R.C.S., at the age of 80. He was the oldest member of the profession in Barrow. A student at St. Bartholomew's Hospital, he qualified in 1867, and held a house appointment at his hospital before becoming resident medical officer at Rossall School. For many years he was honorary consulting surgeon to the North Lonsdale Hospital. He was made a J.P. in 1890.

THE Croonian Lectures

ON SOME

DISORDERS OF MOTILITY AND OF MUSCLE TONE,

WITH SPECIAL REFERENCE TO THE
CORPUS STRIATUM.*Delivered before the Royal College of Physicians of
London*By S. A. KINNIER WILSON, M.D., B.Sc. EDIN.,
F.R.C.P. LOND.,PHYSICIAN FOR OUT-PATIENTS, NATIONAL HOSPITAL, QUEEN-
SQUARE; JUNIOR NEUROLOGIST, KING'S COLLEGE
HOSPITAL; CONSULTING NEUROLOGIST, METRO-
POLITAN ASYLUMS BOARD.

LECTURE IV.*

ATHETOSIS.

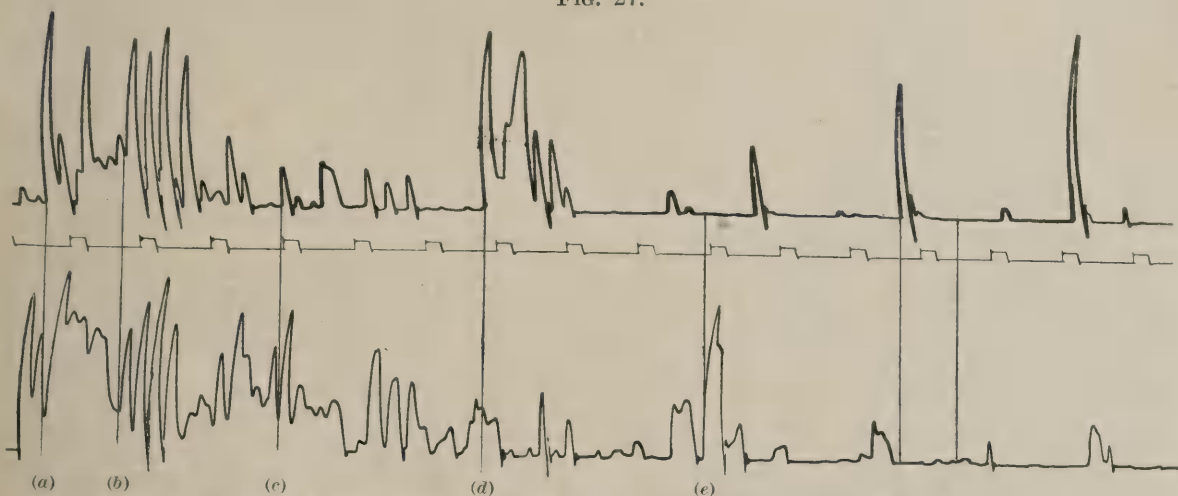
MR. PRESIDENT AND GENTLEMEN,—As with chorea, so with athetosis, a typical case is easy of recognition, though to define the symptom is not equally simple. In 1871 Hammond, who first drew attention to it, stated that "it is mainly characterised by an inability to retain the fingers and toes in any position in which they may be placed, and by their continual motion," and in another passage he said that "the movements are slow, apparently determinate, systematic, and uniform," in contrast to those of [post-hemiplegic] chorea, which are "irregular, jerking, variable, and

flows indifferently into muscular units, the result being a medley of contraction entangling the limb, as it were, and leading to no accomplishment.

During this irregular muscular display varying rigidity naturally makes its appearance, yet unless the athetosis is associated with some degree of "paralysis" there is little, if any, actual fixed rigidity, and this generally bears some proportion to the amount of "paralysis." In fact, during temporary relaxation of athetotic activity the limb musculature is frequently, if not constantly, hypotonic. "Voluntary" innervation of the affected part is always laborious and commonly aggravates the athetoid contractions, at least within a very short period; "voluntary" control over them is fleeting and imperfect.

(2) Closer analysis of the exact nature of athetosis can be made conveniently by means of double tambour tracings, care being taken by adequate limb fixation to ensure the absence from the record of fortuitous (non-athetoid) movements. Fig. 27 reproduces a tracing taken from the left forearm in a striking case of adult athetosis (of vascular origin, and progressive); the upper tracing represents the contractions of the extensor communis digitorum, the lower, of the flexor longus digitorum. At (a) practically synchronous contractions of these opposite muscles occur; at (b) a series of four similar concomitant contractions is seen; between (c) and (d) flexor activity is more pronounced than extensor; at (d) the extensor group contracts vigorously during flexor contraction; and at (e) flexor contractions take place by themselves. The irregularity of the individual contractions of one implicated muscle is well-shown in Fig. 28 (from the same case), recording the innervation of the long finger flexors during a period of extra-excitability. Here contraction follows contraction in an extremely confused fashion, one being often thrown in before the muscle has relaxed

FIG. 27.



Athetosis. Upper record, contractions of left extensor communis digitorum; lower, left flexor longus digitorum.

quick." The contrast between the two, however, is by no means so definite as this description might lead one to suppose.

CLINICAL CHARACTERS.

(1) Athetoid movements are characterised by relative slowness, in apparent contrast with the relative rapidity of choreic movements, and by the perpetual blending of one movement with another, leading to the "continual motion" of Hammond. They form a mixture of irregularly synchronous contractions of opposite muscular groups, so that on occasion the limb or a segment of it is immobilised momentarily in an attitude. The "mobile spasm"

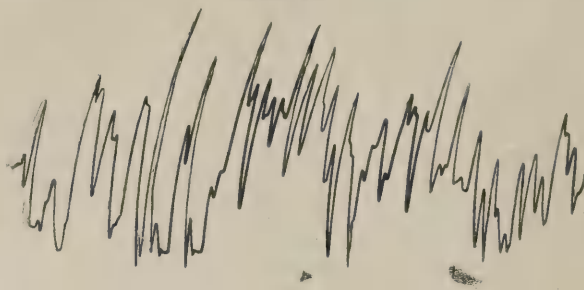
from the previous contraction. Fig. 29 records simultaneously the contractions of the biceps brachii and triceps of the same case; it shows, between (a) and (c), three contractions of the biceps to one (tripled) of the triceps; at (b) reciprocal innervation is completely in default; at (c) flexor and extensor contractions are almost but not quite synchronous; at (d) the triceps contracts and a little later the biceps, both relaxing together; and at (e) the former contracts in four quick innervations by itself.

Another series of records have been taken from a case of right infantile cerebral hemiplegia, with athetosis and Jacksonian epilepsy. In this case I have made use of the extensors of the wrist and fingers, the former normally relaxing (after synergic contraction during closure of the fist) when the fingers are extended.

* Lectures I., II., and III. appeared in THE LANCET of July 4th, 11th, and 25th respectively.

In Figs. 30, 31, and 32 are represented three different results obtained from this patient; in Fig. 30 the wrist extensors relax more or less normally while the finger extensors contract, but they contract again in a quite abnormal fashion, notwithstanding the maintained finger extension; in Fig. 31 the wrist extensors decontract appreciably before the contraction of the finger extensors; in Fig. 32 the finger extensors contract normally, yet the wrist

FIG. 28.



Same case as Fig. 27. Contractions of left flexor longus digitorum during a period of extra-excitability.

extensors hold their contraction for a time, then at length relax, but contract once more. Such modifications of physiological law are quite beyond the power of "volition" to effect. Nothing could more conclusively demonstrate the complete abrogation by disease of the normal physiological interaction of component muscular units in the performance of a given movement, and this interference with physiological law is entirely characteristic of the movements of athetosis. In paralysis agitans, as we have seen, the law is not annulled.

(3) Owing to the essential variability of athetotic contraction no enduring posture might perhaps be expected, yet the "athetoid hand" is sufficiently definite to merit attention. A saddle-shaped posture of the fingers is common, the terminal phalanx being in flexion while the proximal phalanges are in extension; with this extension (often hyperextension) at the metacarpophalangeal joints is coupled a notable flexion at the wrist, so that the hand often assumes that attitude of wrist and fingers which we have seen is of extreme frequency in chorea and which, as we have also seen, represents a "physiological shift" from the posture of the normal hand at rest. In athetosis, further, a tendency for pronation or hyperpronation of the forearm (the "pronator sign") is equally common.

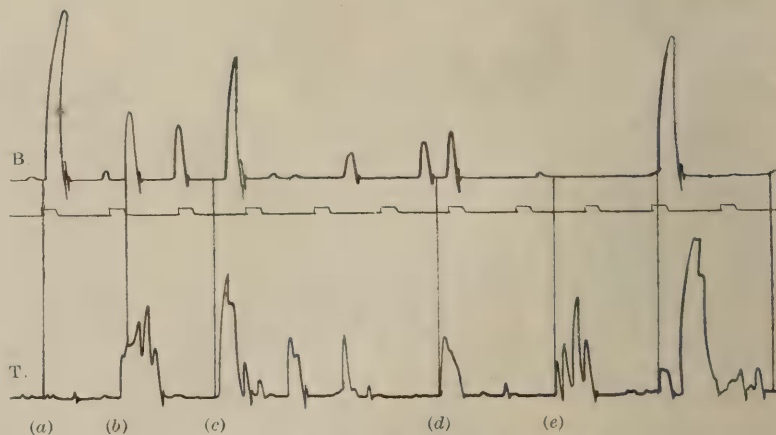
(4) Comparing, now, the symptoms of chorea and athetosis, we find the resemblances more impressive than the differences. In respect of the latter, we have seen that choreic movement is discrete and rapid, while athetoid movement is slow and confluent. But this difference is more apparent than real; athetoid action is slow largely because it is confluent, and, on the other hand, confluent chorea results in slowing of the "spontaneous" movements. Besides, in some athetoses a degree of discreteness and quickness is observable. In respect of resemblances, in each the type of motor derangement is complex, elaborate, and specialised; changeableness and variability of movement is a prominent trait (i.e., absence of essential repetitiveness); the law of reciprocal innervation is at fault in athetosis and in confluent chorea equally;

the movements, "caricatures" though they are in athetosis more than in chorea, have the appearance none the less in the case of the former of being subjectively purposeful—as for grasping or relinquishing an object, &c.—though they are objectively purposeless. In both, a degree of hypotonia is commonly discoverable; resemblances between the athetoid and the choreic hand are sufficiently obvious; involvement of the mechanism for emotional expression, if found in athetosis, is commonly bilateral, as in chorea, though to this there are exceptions. It is difficult to gauge the amount, if any, of actual weakness of the musculature in athetotic cases, since (a) they are not infrequently accompanied by definite corticospinal derangement (hemiplegia or hemiparesis), from which it is desirable to attempt to separate the athetotic element; (b) "volitional" innervation is constantly impeded by athetoid activity, rendering distinction arduous. Enough, however, has been said to justify fully the common grouping of choreic and athetoid movement under the general heading of "choreo-athetosis."

RELATION OF ATHETOSIS TO TONIC INNERVATION.

(5) The condition described as "tonic innervation" is constituted by inability to relax "voluntarily" a given innervation initiated by that process. As the patient "voluntarily" contracts his flexors (say) in movement active inhibition of the antagonists, the extensors, takes place, according to the law of reciprocal innervation; when next he would reverse this movement, he is able "voluntarily" to innervate the extensors, but no corresponding inhibition of the flexors takes place; these remain contracted, it may be for many seconds. From what we have been able to show by clinical methods, a condition resembling tonic innervation, in fact practically identical with it, may occur in athetosis. I have a number of observations confirming this statement, which, for that matter, was fully exemplified in a paper on "The Phenomenon of Tonic Innervation." The symptom was then described as occurring in cerebral cases (frontal) unassociated with athetosis, and as being

FIG. 29.



Same case. Contractions of biceps and triceps.

seen mainly if not solely during so-called "volitional" movement. In the case of athetosis it is found, when present, during so-called "involuntary" activity, in the sense that antagonists may remain definitely contracted though the opposite muscles are rising into contraction, but it often also develops in typical guise during "voluntary" movement. I have already commented on the fact that no phenomenon of this kind has come under my notice in any of the scores of Parkinsonian cases that have been personally investigated.

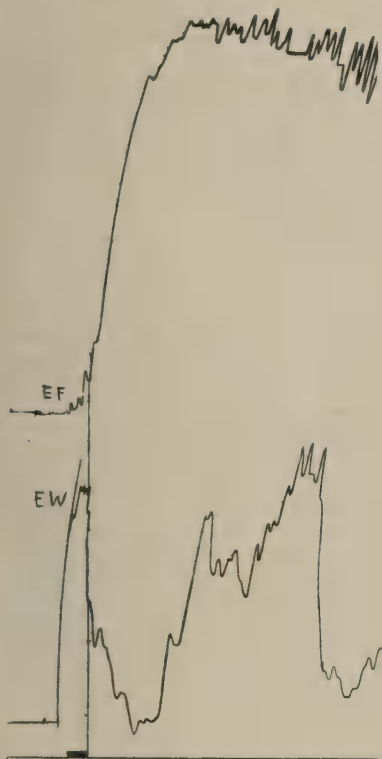
Clearly, it can only be explained satisfactorily by regarding it as a derangement in the proper relation between impulse and inhibition—i.e., as a disorder

of reciprocal innervation. Thus our clinical study of athetosis leads us again to the view that its essential and underlying basis is precisely this interference with the normal laws governing the physiological interaction of component muscular units in movement, and it is immaterial whether this be "voluntary" or "involuntary," for no discriminating line can be drawn between the two.

On the sensory side, there was complete astereognosis in the right hand, with only slight diminution in the appreciation of tactile stimuli.

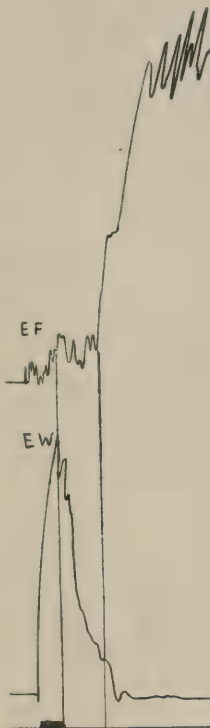
Apparently, an exhaustion paresis of the right corticospinal system made the athetosis temporarily impossible; only with recovery of power did it begin again. The evidence in this case pointed unmistakably to a cortical origin for all the symptoms.

FIG. 30.



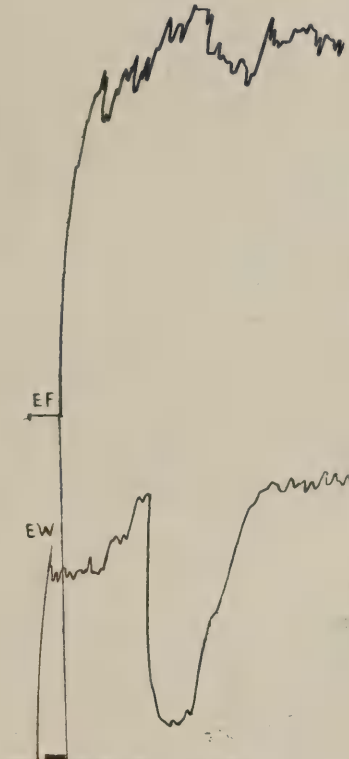
Athetosis. Abrogation of physiological law during movement of extension of the closed fingers: extensors of wrist decontract but contract again.

FIG. 31.



Same case as Fig. 30. Decontraction of wrist extensors before finger extensors contract.

FIG. 32.



Same case as Fig. 30. Wrist extensors fail at first to decontract when finger extensors contract: after later relaxation they contract again.

PATHOGENESIS OF CHOREO-ATHETOSIS.

On the clinical side, evidence has been adduced indicating, both for chorea and for athetosis, that the following considerations bear on the problem of pathogenesis.

(1) Since the movements are active and continuing, for their existence relative integrity of some efferent path is a *sine qua non*. Many cogent arguments suggest that this path is the corticospinal path. I may refer the reader, for a moment, to the summary of the clinical analysis given at the close of the sections on chorea, and supplement the deductions there drawn by one or two more matters bearing on the topic.

Many cases of infantile cerebral hemiplegia with Jacksonian fits are accompanied by athetosis. We assign the hemiplegia and the epilepsy to encephalitis of the cortex and implication of the corticospinal tract, and it is justifiable and reasonable to assume in these cases a cortical origin for the athetosis also. Take a single illustrative case.

A little girl of 14 had suffered from infantile cerebral hemiplegia with athetosis and Jacksonian epilepsy since she was one year old. The aura to the fits was the appearance of "twinkling red, blue, and white lights" in the right field, followed by twitching in the right face and right fingers, which spread in typical Jacksonian fashion. For 20 minutes after each fit all athetosis disappeared from the right limbs.

I refer next to the case recorded by the late Sir Victor Horsley in his Linacre Lecture of 1909. A youth of 15 had had left hemiplegia with severe athetosis since an attack of scarlatina at the age of 7. Horsley found at operation that the right postcentral gyrus was reduced to half its normal size—a very significant observation. He excised the cortical motor area for the left arm, and the athetosis thereafter vanished entirely and had not returned when the patient disappeared from notice some 14 months later. On the other hand, the arm paralysis following the cortical excision had by that time been greatly mitigated. Similar cases have been put on record by Anschütz and others. Reference, too, may be made to Case XVIII. of Jakob's recent monograph, where left-sided athetosis disappeared entirely after a sudden left flaccid hemiplegia. The patient lived for 18 months after, but the athetosis never returned. (I venture to differ altogether from Jakob as regards the interpretation put by him on the pathological findings in this valuable case.)

Strong additional evidence is hereby furnished of the significance of relative integrity of the pyramidal system for chorea and for athetosis. I have never yet found a case of either in which "spontaneous" movements occurred in the presence of absolute corticospinal paralysis. No movements remotely resembling either have been seen in my clinical

cases of decerebrate rigidity in man, and Magnus, similarly, has commented on their absence in his experimental animals (of various species) submitted to decerebration.

(2) Another line of clinical evidence points to the possibility of implication, in choreo-athetotic cases, of afferent paths to the cerebral cortex—viz., from the cerebellum by the regio subthalamica to the optic thalamus, whence there is a wide distribution of fibres to the pallium.

The frequent appearance of muscular hypotonia both in chorea and in athetosis has been mentioned above, and the element of incoördination is prominently in the clinical picture in both, especially, as concerns chorea, in the case of the confluent variety. In numerous instances of chorea the knee-jerk exhibits that "pendular" quality which pertains largely to cases in which cerebellar function is disordered. Now one of the many interesting facts connected with cerebellar dysfunction is, that whether the lesions be on the afferent side to that organ (spinocerebellar), or intracerebellar (cerebellar cortex, or from that cortex to cerebellar ganglia), or cerebellifugal (cerebello-cerebral), the same sorts of symptom to some extent make their appearance in each instance. It is impossible to say by clinical scrutiny alone of a case of cerebellar ataxia in which of these three divisions the lesion is situated. Hence where for other reasons a cerebellifugal (cerebello-cerebral) lesion is likely, we may well expect to find some kind of cerebellar symptoms. If, then, other clinical facts argue a cortical origin for a symptom-complex, the coexistence with it of certain cerebellar symptoms can justifiably be set down to the development of a cerebello-cerebral defect of function.

In other papers I have on more than one occasion laid stress on the many clinico-pathological cases which point to lesions somewhere on the cerebello-mesencephalo-thalamo-cortical apparatus being responsible for the appearance clinically of choreo-athetosis. The reality of "Bindearmchorea" (superior cerebellar peduncle, especially in the neighbourhood of Wernekinck's commissure) is fully established. In several cases of acute thalamic lesion (neothalamus) I have seen pronounced "involuntary" movements of the choreo-athetotic variety. I have in a recent case of "athétose double" found bilateral lesions of the neothalamus (posterior inferior region). A case at present under my care at Queen-square exhibits the thalamic syndrome with athetosis of the same limbs (arm in particular). I might also cite recent experimental work strongly favouring the view here maintained (Lafora), and the older and seemingly forgotten experiments of Bickel and Jakob, who produced so-called "cerebral sensory ataxia" by extirpation of the postcentral cortex, and who specially remarked "the peculiarly explosive character of voluntary movements" after the lesions. This, needless to say, is in fact a choreic character, as has been already discussed.

On purely clinical grounds, however, the evidence here adduced pleads clearly in favour of the hypothesis offered that athetosis and chorea are exteriorised via the corticospinal paths, and that behind their appearance is an afferent disorder of regulation, producing choreiform and athetoid characters in movement, ataxia or incoördination, and hypotonia. This afferent disorder or derangement of regulation is attributable to lesions situated on the cerebello-mesencephalo-thalamo-cortical path already described. As a consequence, "voluntary" movements via the corticospinal tracts exhibit characters corresponding to the functional defects; further, these tracts are, continuously or intermittently, usurped also by "spontaneous" movements of choreiform or athetoid character, movements in many ways closely resembling "voluntary" movements, over which the patient's inhibitory control remains desultory and incomplete. A persistent (or intermittent) stream of disordered cerebello-cerebral afferent

stimuli keeps up the flow of "involuntary" movement; only in sleep are these excitations so damped down as to allow the movements to cease. During waking life, it may be for years, as we have seen, the stream flows to the cortex and the cortex ceaselessly responds.

Thus, in a definite sense, choreo-athetoid activity is the activity of cortical reflex arcs; the movements have cortical quality and yet they are "involuntary."

If the views here offered can be reasonably entertained, they lead to the conception of the possibility of "involuntary" cortical motor activity—a natural development of the hypothesis I have suggested. As far at least as chorea is concerned, the conception appears to me to have much to justify it, and little less in respect of athetosis. *The "spontaneous" activity of choreo-athetosis, thus conceived, is nought else than a succession of cortical "reflexes," high-grade movements largely comparable to those called "voluntary" except that the patient's "volition" neither initiates nor inhibits them.*

Further explanation, however, is requisite, in more than one respect.

(1) When I speak of cerebello-mesencephalo-thalamo-cortical dysfunction being an integral factor in the appearance of choreo-athetotic movements exteriorised via the pyramidal system, I do not limit the association to an anatomical link in the post-central cortex. Thalamo-cortical fibre-systems are widespread, and a frontal radiation is just as definite as any to the postcentral gyrus, and no less important. For, on the efferent side, when I have been speaking in various preceding sections of the corticospinal system being usurped by movements of a "spontaneous" or "involuntary" kind, I do not wish it to be supposed that I regard the anatomical Betz-cell as the physiological terminus a quo of efferent motor activity. On the contrary, many lines of evidence are against such a supposition. From the excitable motor area (Betz-cell area) one does not obtain movements of so elaborate or intricate a pattern as are seen in everyday "volitional" action; the combinations of movement elicitable by the stimulating electrode are anatomical rather than physiological; the "march" of the movements in Jacksonian epilepsy is not paralleled in ordinary normal "volitional activity." For the complex movements of chorea, to take an example, we must postulate a motor centre higher in a physiological sense than that of the motor region *sensu strictiori*, and both clinical, pathological, and experimental evidence suggests that such a centre lies in front of the Rolandic area. Relatively short transcortical neural systems link the frontal to the Betz-cell area, and I imagine, consequently, that the afferent disorder of which I have spoken produces its effect by radiation from the thalamus on this postulated frontal motor centre, quite possibly from the parietal to the frontal cortex, and so on the (anatomical) origin of the corticospinal tracts.

(2) The inability of the choreic or athetotic patient to control adequately the abnormal activity of the cortical arcs of which I have spoken can only mean, translated into physiological terms, failure of transcortical inhibition from some unknown source. His "will-lessness" in respect of the abnormal motility from which he suffers can be nothing else, physiologically, than failure of one cortical element to inhibit another cortical element—a state of affairs the "extreme likelihood" of the occurrence of which is postulated by Sherrington for various fields of cortical action. Prosecution of this point would take me too far from my main thesis at present, but brief allusion to some aspects of the question may not be out of place. The objective study pursued in these lectures precludes, as I have shown, the likelihood of the corticospinal system (Betz-cell to muscle) being "voluntary" in any exclusive sense, though it is the usual path by which "voluntary" movements are

exteriorised. These must "start" at a still higher physiological level, as is apparent from the considerations advanced in the previous section. The "involuntary" movements of chorea are of a higher physiological type than those of Jacksonian epilepsy; therefore even the transcortical part of the whole "voluntary" motor efferent system is on occasion usurped by "involuntary" action. "Volition," therefore—always speaking physiologically—is driven back to some other transcortical source, remote enough from the Betz-cell, from whence its action on the whole motor path—say, fronto-rolandico-spinal—is, in the case of chorea, &c., very imperfect indeed; or, it is driven out by "involuntary" cortical activity. Consideration of the phenomena of chorea and of athetosis, of tonic innervation and of apraxia, and of cortical reflex arc activity in general, in my view, clearly supports this line of argument. "Volition," in short, seems to be little else than transcortical inhibition, a "voluntary movement" little else than a movement that is "allowed" transcortically, an "involuntary movement" (of this high class) little else than one that cannot be transcortically prevented.

It is of interest that the present objective studies point in the direction of these tentative conclusions, since quite other lines of research by other workers seem to indicate dissatisfaction with current conceptions. Lashley, for example, says "the conception of volitional activity is too vague to have any scientific value," and holds that the "volitional" or "automatic" character of the centrifugal neural impulses of the cortex can be defined "only in terms of their complexity of organisation and their relative importance in the total motor integration." Von Monakow, after declaring that the common views of pyramidal function must be essentially modified, says "it is probable that the pyramidal areas serve less for the execution of voluntary movements than for the inhibition of the kinetic functions of spinal coördination. Their function seems to be in the class of reflex activity." If lower centres are less under the directive than the inhibitory influence of higher centres, the same may well be true of some among the cortical centres themselves.

{3} Reverting finally, in this connexion, to the demonstrated disorder of reciprocal innervation characteristic of choreo-athetosis, we have to examine the question of the physiological level at which this phenomenon takes place. Reciprocal innervation is readily obtainable by stimulation of any particular single point on the motor cortex proper, but it is also produced by excitation of the internal capsule, the pyramids in the medulla, and at still lower levels. The action of arrest of one muscle and excitation of its opposite may certainly be elicited from the cortex, but, in Sherrington's own words, "the seat of inhibition in these reactions from the motor cortex lies probably at the place of confluence of conducting channels in a common path, likely enough at their confluence upon the 'final common path'—in other words, at the spinal level. Clinically, too, it is likely, from a consideration of data that I cannot now elaborate, that the link between the muscular components of a given movement (protagonists, synergists, and antagonists) develops its activity at the spinal level, but this is not the whole question. We know quite well that reciprocal innervation is typical of the numerous spinal reflexes which can be elicited by stimulation of dorsal roots; this has been performed seriatim for cervical and lumbar roots by Sherrington and by Page May, and the widespread movement patterns thus obtained are systematised and largely invariable. Without reciprocal innervation such spinal reflexes would be impossible. Spinal coördination exists. But from the cortex itself, as we have seen, similar coördinated movements can be obtained, although they are limited in extent, as has already been remarked. Whether precisely the same coördinating mechanism in the cord is used both for spinal reflexes and for cortical impulses is undetermined; according to Graham Brown, "there is a

finely differentiated mechanism in the motor cortex which does not set into action spinal centres in the same manner as do the in-going nerve-impulses carried by the sensory nerves of a limb, but is able in some way to pick out and set into action small portions, as it were, of the simple reflex movements." Be this as it may, *since reciprocal innervation is obtainable from the cortex, it can be deranged from the cortex.* It is in fact completely deranged in so-called tonic innervation, as I have previously demonstrated, and in these cases the lesions are situated in the frontal region and a transcortical effect is exercised on the pyramidal system. It is also entirely disorganised in choreo-athetosis, as has here been fully exemplified, and the argument which I have developed points definitely in the direction of a cortical arc being utilised for the hypermotility of these clinical states. While the ultimate stage probably is spinal, *the origin of the disorder in chorea and in athetosis is on the afferent side to the cortex or in transcortical neural systems from the afferent to the efferent side.*

I am not disinclined, from a study of my clinical cases, to suggest it is the cerebellar element, as I have already indicated, in the afferent cerebello-cerebral defect of regulation, that is responsible for the disarray of component units in a cortical movement, "involuntary" as the latter is (in the cases under consideration), and some experimental support for this view is forthcoming in the recent researches of Tilney and Pike. Although on clinical grounds I am not in accord with their general standpoint, their conclusion that the cerebellum appears to play a prominent rôle in maintaining the proper relation in the "synergic units" of the body has not a little to be said in its favour.

(To be concluded.)

Clinical and Laboratory Notes.

A CASE OF

ACUTE INTESTINAL OBSTRUCTION

DUE TO THE PRESENCE OF A DRAINAGE-TUBE LEFT IN THE PERITONEAL CAVITY.

BY R. LESTER WILLIAMS, M.B., B.CH. CAMB.,
F.R.C.S. ENG.,

LATE RESIDENT SURGICAL OFFICER, ROYAL INFIRMARY,
SHEFFIELD.

THE following case of a foreign body lying unsuspected in the peritoneal cavity for 12½ years and causing no inconvenience is sufficiently unusual to justify its being placed on record.

R. H. J., male, aged 32, was admitted to the Sheffield Royal Infirmary on Jan. 13th last.

History.—On Jan. 11th at 4.45 P.M., while on his way to work, he commenced with slight abdominal pain. At 6 P.M. the pain was worse, and at 8 P.M. it became so severe that he had to leave work and return home. He vomited the same evening, and vomited repeatedly up to the time of admission. The bowels last acted on the morning of the 11th. On the 13th he was seen by his own doctor, who ordered two soap enemata at an interval of half an hour; the results of which were so poor that he ordered immediate removal of the patient to hospital with a diagnosis of intestinal obstruction. Previous history was as follows. In August, 1912, he had been operated upon for acute appendicitis, when an appendicular abscess was opened and drained with a rubber tube, but the appendix itself was not removed. After recovery from this operation he was sent home, and three weeks later was readmitted and the appendix removed. Since then he has remained perfectly well, and at work all the time. He has had no abdominal pain of any sort, and his bowels have acted daily without aperients.

Condition on Admission.—The patient was a healthy-looking man. Temp. 99.6 F°, pulse 80. A healthy healed pararectal appendicular scar was present. Abdomen distended and moved poorly with respiration. There was some slight general abdominal tenderness. Percussion

yielded generalised tympanitic note; liver dullness normal. Rectal examination was very painful and could not be satisfactorily carried out. A diagnosis of acute intestinal obstruction due probably to adhesions or bands following the original operation for appendicitis was arrived at, and an immediate operation was performed.

Operation.—The abdomen was opened through a right lower paramedian incision. Coils of distended small intestine at once presented. The region of the old appendicectomy scar was first explored, but beyond some adhesions between the scar and the great omentum nothing abnormal was discovered. Passing down into the left side of the pelvis from the right iliac fossa a tubular structure not unlike a calcified internal iliac artery was felt. As there was no pulsation it was very cautiously dissected out from its sheath of peritoneum and fibrous tissue, and was found to be a piece of ordinary red rubber drainage-tube. On investigation of the pelvis it was discovered that the distal 4 cm. of the tube had passed through an aperture in the lowest part of the root of the pelvic mesocolon. Through this aperture had passed also about 3 feet of small intestine which had become strangulated. The strangulated gut was reduced without great difficulty, and on examination was found to be deeply congested but quite viable. The next problem was to close the opening in the pelvic mesocolon so as to prevent the possibility of a recurrence of the strangulation. The patient was placed in the Trendelenburg position and, with the aid of a headlight, a good view of the aperture in the pelvic mesocolon was obtained. The aperture admitted two fingers and running along its posterior margin were the inferior mesenteric artery and vein. The aperture was closed with some difficulty with two catgut sutures, during the introduction of which great care had to be taken to avoid damage to the inferior mesenteric vessels. The abdomen was closed in layers without drainage.

The patient made an excellent recovery and was discharged from hospital as cured 14 days after the operation. The drainage-tube measured 15 cm. in length and 1 cm. in diameter, and was in a perfect state of preservation. It contained four lateral holes (evidently for drainage), and the point where it passed through the hole in the pelvic mesocolon was marked by a well-defined constriction.

Comments.

The remarkable feature of this case is that, although the patient had this large drainage-tube in his abdominal cavity during the 12½ years that elapsed between the two original operations for appendicitis and the present operation for acute obstruction, he was nevertheless absolutely well, quite free from abdominal symptoms of any sort, and able to do full work. One would expect that the presence of a large drainage-tube amongst the intestines would have given rise to at least some abdominal symptoms due to the peristaltic action of the intestines pressing the tube downwards into the pelvis and through the base of the pelvic mesocolon. Had the tube not given rise to the attack of acute obstruction its presence could never have been suspected. The only really difficult part of the operation was the closure of the opening in the pelvic mesocolon which was so deep in the pelvis and which had the inferior mesenteric artery in such close relationship. The case illustrates the fact that although a large foreign body may lie for years unsuspected in the peritoneal cavity, it is always a source of potential danger to its host whose life it may place at any moment in the gravest jeopardy.

In conclusion, I wish to thank Mr. Ernest Finch, under whose care the patient was admitted, for his permission to publish this case.

VASO-NEUROSIS CAUSED BY TOXIC IDIOPATHY TO MILK IN A CHILD.

By HECTOR M. WALKER, M.D. GLASG.

THE following case of vaso-neurosis in a child of 10½ months seems to be worthy of recording.

The baby, a male, weighed 21½ lb. He was 8½ lb. when born. He had no illness beyond a rather troublesome dry eczema on the head, which came on when 2½ months old and lasted until about 6 months.

Condition on Examination.—When I saw him the mother complained that he had been sneezing a great deal for about a week and that lately he had come out in spots. On examination I found that he had an extensive urticaria on

the front of the chest, abdomen, and legs. The right ear also was swollen to about twice its normal size, and was hot and red. The mucous membrane of the nose and throat was hyperæmic, but there was no catarrh. The swelling of the ear must have come on very quickly, since the parents had not noticed it, and it subsided about an hour after I left. The urticaria disappeared several hours later, but reappeared on the three following days, the attacks never lasting for long. Once the other ear became swollen. On the third day he developed diarrhoea, passing numerous small loose stools which contained abundant mucus. He had no sickness or temperature, but the appetite was poor. The mucus in the stools lasted for about three days.

The mother told me that the urticaria seemed to come on usually about an hour after he had taken any cow's milk. I did a sensitisation test by scarifying the skin on the arm and placing a drop of milk on it, and in about ten minutes there was an extremely marked reaction, a large circular red wheal being produced.

This case shows a general disturbance of the vascular innervation caused by sensitiveness to a foreign protein. By leaving cow's milk out of the diet there have been no further attacks of the urticaria, but the sneezing has persisted, although not so frequently as before. The association of urticaria, angino-neurotic oedema, vaso-motor rhinitis, and mucous colitis at the same time and in the same case is interesting. It seems probable in this case that the colitis was caused by the same influences which, acting on the skin, had caused the urticaria and, on the nasal mucous membrane, the rhinitis. There is no family history of asthma or vaso-neurosis.

Harrow.

A LOOSE BODY IN THE TUNICA VAGINALIS.

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I HAVE never met with any reference to a loose body in the tunica vaginalis, and the following note would appear to be of sufficient interest to place on record.

A boy of 8 was operated on in May, 1925, for a right undescended testicle, which was lying in the inguinal canal. On opening the tunica vaginalis a firm white mass, the size of a small pea, at once presented and slipped out. It was lying quite free, and there was no pedicle or adhesion whatever. The testicle, though maldeveloped, appeared otherwise anatomically normal. On microscopical examination of the loose body the section showed necrotic and amorphous fibrous tissue with areas of calcification.

What the origin of this body was it is difficult to say. Perhaps it was a detached cyst of the epididymis, or represented a cystic (? and tuberculous) degeneration of the hydatid of Morgagni or of the hydatid of the epididymis.

THE PRIZE-GIVING AT EPSOM COLLEGE.—Over 500 parents and friends were present on Saturday last at Epsom College, when the prizes were distributed by Lord Beauchamp. The following members of the Council were on the platform: Dr. Raymond Crawford, Dr. F. de Havilland Hall, Mr. Owen Lankester, Mr. Aeneas Mackay, Mr. Samuel Osborn, Sir StClair Thomson, Sir Squire Sprigge, Dr. Harold Spitta, Sir John F. H. Broadbent, Surgeon Rear-Admiral Sir Percy Bassett-Smith, Mr. Douglas C. Bartley, Sir Ernest Goodhart, Dr. E. Climson Greenwood, Dr. Seymour Taylor, Sir Henry Dixon Kimber, Mr. T. Hollis Walker, K.C., Mr. A. Arthur Napper, and Sir William Hale-White. The headmaster, Mr. Arnold C. Powell, mentioned individual scholastic achievements by the boys, and said that in sports also the school was holding a good place. Lord Beauchamp, in presenting the prizes, said that the most important factor in education was not the prize, but the attempt to secure the prize. Dr. Raymond Crawford, Chairman of the Council, in proposing a vote of thanks to Lord Beauchamp, referred to the improvements in the equipment of the school effected during the past year, and those in immediate contemplation, and mentioned as two needs still existing a new infirmary, which would leave the old building available for the accommodation of more boys, and the levelling of the Lower School playing fields. The vote of thanks was carried by acclamation, after which tea was served on the lawns, where the band of the Second Battalion of the Queen's Own Royal West Kent Regiment played during the afternoon.

Medical Societies.

MEDICO-PSYCHOLOGICAL ASSOCIATION.

BIRMINGHAM, JULY 6TH-10TH.

THE annual meeting of the Medico-Psychological Association of Great Britain and Ireland was held at the University of Birmingham on July 6th to 10th, under the presidency of Sir FREDERICK MOTT, F.R.S.

The PRESIDENT announced that the Council had nominated Lieut.-Colonel J. R. LORD, C.B.E., M.B., editor of the *Journal of Mental Science*, to be the next President.

The Sympathetic Endocrine System.

Dr. DAVID ORR (Prestwich Asylum) gave a lantern demonstration on the Sympathetic Endocrine System. Dr. Orr said that intellectual life was inseparable from emotion. Certain areas of the brain were associated with the registration of visceral impressions, and there was no impression in any part of the body which was not registered in the brain and which did not immediately react on certain organs. The central nervous system could not be spoken of as a system per se; it was intimately connected with the sympathetic system, and this latter with the ductless glands. As every impression reached the brain it was accompanied not only by its own specific sense, but by an emotional content, and it aroused certain things; it produced either a pleasant or an unpleasant sensation, as there was no such thing in the human mind as a negative impression. Dr. Orr proceeded to elaborate his thesis, and demonstrated what took place during a nervous upset. His main thesis was the intimate coöperative working of the whole mechanism and the need for treating patients from the physiological point of view.

The contribution was discussed by Dr. M. J. NOLAN, the PRESIDENT, Dr. W. F. MENZIES, Prof. G. M. ROBERTSON, and Dr. LORD.—Dr. ORR replied.

President's Address.

Sir FREDERICK MOTT then delivered his address. He said that no progress was possible in knowledge of mental disease until the spell of metaphysical speculation had been shaken off, as that carried with it the doctrine of mind as an invisible intangible spirit with an existence separate from the body. The functions of mind depended on the whole body and on the harmonious action of all its parts. In the apparently healthy brain there might be subtle biochemical and biophysical conditions which were dependent on inborn functional or bodily defects. The highest level of the brain was the first to undergo the deleterious effects of any form of intoxication. This highest level represented the psychic personality of the individual, and was the personal equation due to inborn tendencies and characters derived from racial and familial ancestry, near and remote. In mental disease there might be no discovered differences in the brain structure, even by powerful microscopy. There might perhaps be a vital germinal deficiency manifesting itself by an arrest of the development of many of the cortical neurons or a lack of durability. Or vascular conditions might be present which interfered with the nutrition of the rapidly developing neurons.

The speaker then proceeded to deal with the changes in the mental attitude coincident with the involutional period, adolescence, remarking that all psychic activities were subordinate to and dependent upon physiological processes. The functional correlation of mind and body was shown by the profound influence which the reproductive endocrine system exerted upon the evolution at puberty and on the sentiments which had their roots in the sex instinct. Steinach had shown that the substances of internal secretion had a selective action in storage in the central nervous system, and it was not sufficiently recognised that a climacteric might occur in men between 55 and 65 years of age,

being associated in some of them—but not in all—with arterio-sclerosis. Some cases of involuntary melancholia had their origin in testicular regression and the concomitant endocrine gland changes. A study of relatives in a large series of cases in the London county asylums revealed three main facts in relation to the causation of mental disease: (1) The importance of a neuropathic and psychopathic heredity; (2) the special liability of the neuroses and psychoses to occur in adolescence; and (3) the influence of child-bearing and lactation in women, acting as an exciting cause.

The general conclusion he wished to enforce was that it was the duty of medico-psychologists to practise general medicine in its broadest sense, and ascertain whether there was present any body condition which could act either as a cause or a contributory factor in the production of the abnormal psychic state.

Psychological Implications of Encephalitis Lethargica.

Dr. G. A. AUDEN pointed out that the late sequelæ of this infection gave it a sinister importance which was intensified by the steep rise in the epidemic incidence which had marked the past year. Encephalitis opened up an entirely new outlook in psychiatry and neurology, which might bring us to a better understanding of the genesis of certain psychoses and neuroses. Confining his remarks to children between 5 and 15 years of age, he pointed out that the clinical picture presented by the disease was one of a generalised toxic condition, which fell with especial weight upon the nervous system; while the later manifestations, both psychic and somatic, formed a syndrome which gave all the features of a definite and distinct morbid entity. One of these was a characteristic failure of adjustment to the inhibitions and sanctions of the social order, especially in the direction of persistent thieving and lying. Other features, such as a reversal of the normal sleep rhythm, coupled with noisy excitability and perverse habits, seemed to bring the disease into definite relationship with certain types of mental disorder. A considerable number of children developed peculiar habits and tics. Some of these might be attributed in the first instance to increased suggestibility—e.g., the hawking and spitting might be the result of a salivation which had passed off. Occasionally cases showed iteration-compulsions. In some of the advanced cases of Parkinsonism there was a superficial resemblance to catatonia, but in these cases, as Economo had pointed out, the patients were apperceptively and intellectually intact; appreciating fully their relation to their environment; well orientated, and with undiminished critical judgment. The main characteristics were a combination of mental apathy with explosive irritability, a rapid onset of fatigue, and a marked drop in attention, with a heightened susceptibility to emotional stress. These might be correlated with an inhibition of volition and a failure of the exercise of self-criticism. In the opinion of the author the theory of the development of the nervous system put forward by Head and Rivers gave a key to the proper understanding of these character changes and volition defects. They appeared to be *regressions* due to a removal or suppression of the epicritic control over the protopathic instinctive tendencies. The child was essentially, in Lloyd Morgan's phrase, a "self of enjoyment," and it was only as he grew that the ceaseless stream of suggestions of social import raised in him a predisposition towards social conduct. He submitted the following table relating to 64 cases submitted to him for examination:—

	Cases.	Morbid changes (per cent.).
Reduced intelligence	29	45·3
Disturbed sleep rhythm	50	78·1
Marked irritability	45	71·3
Moral defects and character changes	21	32·8
Parkinsonism, bradykinesia, tremors	27	42·1
Perverved habits	29	45·3

With regard to treatment, if the theory set forth in the paper was correct, punishment could have little or no deterrent effect; indeed, it might have disastrous results by fixing an antisocial attitude through the creation of a conflict or an inferiority complex. Under the simple and regulated life of a special institution, differing from the Borstal or industrial school type, sufferers from encephalitis lethargica would re-acquire the necessary epicritic control to enable them to again take their places in ordinary life.

The PRESIDENT showed on the screen slides of the lesions he had found in cases of encephalitis lethargica, and briefly discussed the paper.—Dr. P. C. P. CLOAKE (Birmingham) agreed with Dr. Auden's conclusions. This disease could be put in the great group of toxic cases with mental symptoms, and he considered that the mind was disordered differently under the influence of different toxins. He discussed the pathology of the sleepy state at some length.—The paper was also discussed by Dr. G. H. MELSON, Dr. S. J. COLE, Dr. TAYLOR, Dr. LORD, Dr. HELEN BOYLE, and Dr. A. M. McCUTCHEON.—Dr. AUDEN replied.

Chronic Infective Processes in Mental Disorder.

Dr. T. C. GRAVES (medical superintendent, Hollymoor Asylum) read a paper on the Incidence of Chronic Infective Processes in Association with Mental Disorder. He said that often the conditions found were beyond the possibility of cure, as they were slow, insidious, and hidden, and sometimes they had not given evidence of their presence. He narrated a number of cases in which slides of the dental condition were shown and the clinical notes read out. In some cases after extraction of teeth a root had been left, and the shutting in of infection had led to spread into the bone. Some people with undoubted septic foci seemed not to suffer disability from them, the explanation being that they were putting up an effective resistance. He also dealt with the questions of sinus infection, infection of ear, tongue, tonsils, and in the female the genital tract, and contended that these septic processes played a definite part in the causation and the duration of mental disorder.

The paper was discussed by the PRESIDENT, Dr. CLOAKE, Dr. BEDFORD PIERCE, and Dr. J. G. SOUTAR. Dr. GRAVES replied.

Delinquency.

Dr. W. A. POTTS read a contribution on this subject. He said he thought the time would come when all sexual offenders, those of a kind now sent to remand homes and those who had committed serious offences, would be referred for a special medical examination. The first duty was to see that the person concerned was not suffering from a physical or psychological handicap, the latter being divisible into inborn and environmental. The presence of a physical disability did not mean that there was not a psychical one also; but when a physical factor had been efficiently dealt with the psychological factor disappeared. Of this he quoted some convincing examples. In many cases of juvenile delinquency the problem was the parents. It had been said that 10 per cent. of delinquents were mentally defective, but Dr. Potts regarded that figure as much too high; it was nearer 2 per cent. Mental conflicts must be recognised and treated as such. Usually the delinquent was failing along more than one line. He had found that homosexual offenders had been retarded, especially on the emotional side, and they responded well to psychoanalysis.

There was a full discussion on this paper, the participants being Dr. R. W. BRANTHWAITE, Dr. McCUTCHEON, Dr. MARR, Dr. HAMBLIN SMITH, Dr. LORD, and Dr. SOUTAR, and Dr. POTTS replied.

The Iodine Content of Thyroid Glands.

Dr. F. A. PICKWORTH read a paper with this title. It represented a further stage of the work done by Sir Frederick Mott and submitted to the Association at its meeting in Belfast last year, its aim being to

correlate the iodine content with histological structure and the mental and bodily condition of the patient. Dr. Pickworth described and demonstrated in the asylum laboratory his new method of ascertaining the iodine content in glands. It consisted of the destruction of the organic matter by fusion with alkali and oxidation of the resulting iodide to iodate with permanganate solution, the excess of the latter being removed by means of animal charcoal. After filtering, potassium iodide was added, and the iodine titrated with thiosulphate. Arterio-sclerotic glands showed less iodine, and in fibrotic glands the iodine was very low indeed. A case of tuberculosis showed a lowered iodine content, but one of miliary tuberculosis showed iodine above the normal. A low quantity of iodine was also found in melancholia, mania, dementia præcox, and arterio-sclerosis, as well as in dementia. In the 39 cases of general paralysis of the insane there was a large range of variation in this respect. It became clear from this investigation of over 100 cases that the iodine content in the thyroid was very important in combating infections, though it probably was associated in this influence with the endocrine products.

Institutional Treatment of Mental Defectives.

Dr. A. M. McCUTCHEON read a paper on this subject, with special reference to occupational training. He said the objects of the treatment of mental defectives in institutions were four: (1) to correct their antisocial conduct; (2) to restore their self-respect and happiness; (3) to teach them the work for which they seemed most fitted, leading to discharge, if possible; and (4) by stopping the procreation of children and so to prevent the blight from being handed on. All these could best be achieved, he thought, by segregating them in institutions, preferably of the colony type. A keynote to success was adequate classification. There was a good discussion.

The Psychopathic Personality.

This subject was dealt with in a paper by Dr. HAMBLIN SMITH (medical officer, Birmingham Prison). He said the cases dealt with formed a large but ill-defined group, the members of which found it impossible to make satisfactory social adjustments. They had a strong inferiority complex, and however well the physical treatment of them might be carried out, the psychical must not be neglected. These people had a "shut-in" personality, and the hope for the future lay in taking the psychological view of them.

At the dinner the Lord Mayor of Birmingham (Hon. PERCIVAL BOWER), Dr. NATHAN RAW, Miss BARTLEET, J.P., Prof. KAUFFMANN, Prof. Sir JOHN ROBERTSON, and Alderman J. H. LLOYD, J.P., were among the guests, while there was a good attendance of prominent members of the Association. A visit was also paid to the Hollymoor Mental Hospital.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on July 1st, the President, Sir DAVID WALLACE, being in the chair. Sir EDWARD SHARPEY SCHAFFER opened a discussion on

The Pituitary.

Dealing first with the anatomy of the gland, he demonstrated its four parts, and its embryological development. The pars nervosa was formed from the brain tissue, the other three parts, pars anterior, medialis, and tuberalis respectively, being of epithelial derivation. The pars tuberalis surrounded the tuber cinereum, thus remaining unremoved in the so-called complete removal of the gland. The main network of vessels for the blood-supply to the gland was in the pars tuberalis and pars anterior, and therefore these

parts were the seat of the maximum glandular activity. Numerous sections of the gland were shown demonstrating colloid material and its escape into the cerebro-spinal fluid in the third ventricle of the brain. The posterior lobe consisted of the pars intermedia and the pars nervosa, and the physiological action on the circulation of alcoholic extracts from this lobe were described. On first injection a marked rise was seen, but on a "repeat" dose a fall resulted. The injection from the posterior lobe of the gland caused a marked contraction of the intestine, bladder, and uterus. Milk secretion was notably stimulated, and this even occurred in mammals when an extract of fish's pituitary was used. In the urine a highly diuretic action was exhibited, but repeat doses might cause a lessened secretion. Entirely different actions of stimulation and inhibition were obtained from alcoholic extracts of the gland and of the residue after extraction. The physiological standardisation of tests was described. These were: oxytocic test, pressor test, melanophore test, urinary test, and mammary test. The anterior lobe was concerned with the growth and development in mammals, birds, and amphibia, and administration of the anterior lobe, whether orally or subcutaneously, caused excessive growth and gigantism, while removal of the gland produced the opposite effect. Prof. Schafer remarked on recent and useful work which had been performed in a study of the gland and its action.

Discussion.

Mr. H. M. TRAQUAIR spoke on the subject from the view-point of the ophthalmologist. Symptoms from enlargement of pituitary were of two sorts, glandular and local; the latter, due entirely to mechanical pressure, manifested themselves in visual changes. The effect of pressure was modified by the local anatomical formations, as the gland itself lay in the immediate vicinity of the optic chiasma. Enlargement caused diminution of the fields of vision. Slides were shown of the chiasma and numerous slides of visual fields demonstrating the progressive diminution in size, which occurred in a clockwise or anti-clockwise direction according to the eye affected.

Mr. NORMAN DOTT described various pathological conditions such as tumours, affecting the gland and the subsequent symptoms, which depended on whether the tumour enlarged in an upward direction or not. Destructive growths were accompanied by hypo-pituitarism, while growths of an adenomatous nature caused excessive secretion and corresponding symptoms of body-growth and function in general. Diagnosis was greatly aided by radiograms defining the sella turcica and revealing calcification which occasionally took place as a degenerative change. Operative interference could be carried out from above through the cranial vault or from below through the nose.

Prof. JOHN FRASER referred to the marked increase in growth of tadpoles fed on pituitary tissue. Prof. EDWIN BRAMWELL spoke of a case of myopathy he was treating which presented all the features of hypo-pituitarism. Several cases of this type had been described in the literature and the association of the two conditions was too frequent to be regarded as a coincidence.

SOCIETY OF SUPERINTENDENTS OF TUBERCULOSIS INSTITUTIONS.

A MEETING of this Society was held at 122, Harley-street on July 6th, Dr. JAMES WATT, the President, in the chair.

Dr. PETER EDWARDS opened a discussion on

The Treatment of Pleurisy.

He regarded all pleural effusions as tuberculous unless negated by the guinea-pig inoculation test; since pyopneumothorax was occasionally afebrile he

advised the examination of all effusions. He considered that efficient strapping of the chest diminished the incidence of effusions. When an effusion occurred in the less active side of a bilateral case he recommended partial aspiration and temporary gas replacement, employing a small-bore needle after previous softening, if necessary, with Sir Henry Gauvain's "1.2.3" solution; complete aspiration resulted in a rapid recurrence of the fluid. Dr. Edwards emphasised the importance of rigid asepsis in cases of artificial pneumothorax, and said that he was satisfied that neither the bore of the needle, the degree of pressure, the type of gas, nor its temperature had any influence on the development of effusions. The type of fluid was important on account of the production of adhesions, and it should be removed when it masked the full view of the collapsed lung, in spite of Dumarest's faith in the utility of benign effusions, because (1) the pleura still thickened after gas replacement; (2) all Dr. Edwards's cases of perforation had occurred in hydropneumothorax cases; (3) he considered fluid a very inefficient splint. If the effusions were left there should be a daily cytological examination and screening both in upright and recumbent positions. Other indications for gas replacement were: (1) When the mediastinum tended to move towards the side of the collapsed lung—here a high positive pressure should be left; and (2) when the fluid was fibrinous. In cases where it was purulent 10 c.cm. of a 0.2 per cent. solution of methylene-blue might be injected into it; this did not stop fluid formation but it mitigated the malignancy. Occasionally he had irrigated with saline, leaving a small quantity of methylene-blue solution in the cavity. He quoted Water's successful employment of Churchman's joint-irrigation apparatus in aspirating the fluid, irrigating first with saline, then with a 1 in 1000 gentian-violet solution until the return flow is clear, and finally leaving a small quantity of the latter in the cavity. He had abandoned as quite ineffective the method of auto-serotherapy. For an effusion in the contra-lateral side of an artificial pneumothorax case he lowered the pressure and so made the pneumothorax partial, this being definitely advantageous, and then he aspirated.

Dr. ELEANOR SOLTAU drew attention to the fact that adherent pleura occasionally occurred unexpectedly in early cases without giving rise to any symptoms. One of the most useful indications was the sucking in of the intercostal spaces on inspiration, especially noticeable when the patient was in the usual position for induction of artificial pneumothorax. Dry pleurisy was not a hindrance and the subsequent limitation of movement, due to formation of adhesions, was probably beneficial.

Dr. A. R. SNOWDEN, in dealing with chronic and purulent effusions, excluded empyemata and limited himself to purulent effusions subsequent to a pneumothorax, spontaneous or artificial, or arising de novo from acute effusions. Removal or reduction of such was not advisable as a routine measure, but was indicated in the following circumstances: (1) If any interference with the circulation or heart's action were present. (2) If associated with indigestion, usually resultant from toxic and mechanical causes. (3) When the liquid filled two-thirds of the actual pleural cavity owing to the risk of jellification. (4) If active pus formation were in progress. Apart from these drawbacks, he considered an effusion to have a neutral if not a beneficial action as a splint and as a restraining influence on an irritable diaphragm, though an inert gas replacement resulted in less thickening and also allowed of more accurate X ray screening of the collapsed lung. He divided cases in two classes: (1) Those to be left alone, or have their fluid level maintained steady by gas replacement, keeping the final inspiratory and expiratory pressures constant. (2) Those to be eliminated by repeated gas replacements, with diminishing gas pressures. If the effusion be chronic the replacement should be done by degrees with intervals of from 3 to 14 days. He deprecated the frequent use of high pressures. Nitrogen, oxygen,

and very dilute chlorine were the gases employed, but oxygen was found very irritant. In his experience purulent effusions were usually sterile and tended to clear up more quickly than simple ones. He had seen afebrile purulent effusions become non-purulent under the influence of ultra-violet radiation. Small doses of sunlight had also been beneficial. He had discontinued lavage as it caused thickening and occasionally sinus formation.

Dr. COLIN MILNE first discussed the differential diagnosis and then reviewed in detail the elements of local and general treatment of dry pleurisy. He pointed out that the induction of artificial pneumothorax for pleuritic pain was of limited use since it often occurred on the less affected side in bilateral cases. He quoted Fishberg's statement that 40 per cent. of dry pleurisies were tuberculous, in view of which he doubted the wisdom of alarming the patient unduly by diagnosing him as tuberculous in the absence of other physical signs. For the neurotic type of patient with pleuritic pain he resorted to the more drastic counter-irritants. In other patients he regarded pain as an indication of an exacerbation of the disease and ordered increased rest.

Discussion.

Dr. H. DE CARLE WOODCOCK reported that he had not had satisfactory results with gas replacement or injection of antiseptics in the more virulent forms of purulent effusions, but in simple effusions replacement was worth doing. He quoted Mr. Morriston Davies's recommendation to remove the gas if fluid returned so rapidly as to cause distress.

Dr. F. R. G. HEAF strongly recommended the inunction of iodox followed by exposure to radiant heat. He disagreed with Dr. Edwards's view that fluid was not an efficient splint.

Dr. G. M. MAYBERRY also advocated the use of iodox, but found methyl salicylate a useful addition.

Dr. ESTHER CARLING had found expectant treatment the best, and Dr. W. C. FOWLER reported favourably of his experiences with the use of radiant heat.

Dr. C. D. S. AGASSIZ replied to Dr. J. D. LEIGH's inquiry as to the occurrence of effusion in children, that it was very rare, and those few that did develop were probably not tuberculous.

A communication from Dr. VERE PEARSON was read in which he considered that oxygen replacement of an effusion following artificial pneumothorax was indicated in these circumstances: (1) If the chest were three-quarters full. (2) If the chest were one-third or more full, but associated for more than three and a half weeks with toxæmic symptoms. (3) If X rays showed that there was a danger of the lung expanding and becoming adherent. (4) If the fluid, though small in amount, was causing serious discomfort to the patient; this might occur in a convalescent patient on resuming a more active life. (5) In the rare cases of secondary infection of the fluid. In the case of spontaneous pneumothorax roughly the same rules for withdrawal of fluid held good, but the situation was complicated by the presence of an opening in the lung and frequently by secondary infection. Treatment must aim at dealing with these difficulties as well as at keeping the lung compressed long enough to obtain healing of the disease. Skilful adjustment of pressure by gas or fluid-withdrawal aided in healing the hole, while suction drainage and washing out the pleura often diminished the bad effects of sepsis. Open drainage was seldom called for, as it was very difficult to secure closure of the external sinus, and with this type of patient the hole in the lung also tended to remain unhealed. Thoracoplasty was sometimes of use in these cases provided the patient's general condition was good.

THE Nineteenth Voyage d'Études Médicales, which had been announced for September next, will not take place, difficulties having arisen at the last moment with respect to the facilities offered.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 182.)

EVIDENCE OF OPTICIANS' ASSOCIATIONS.

Institute of Ophthalmic Opticians.

(App. LX. and Q. 17483-17617.)

EVIDENCE was given on behalf of this Institute by Mr. Owen Aves, Mr. F. T. Gregg, and Mr. J. Forrest. Its members number over 1300 qualified persons; they are limited to those who hold (1) the qualification by examination for sight-testing of the Worshipful Company of Spectacle Makers; (2) the qualifications of the British Optical Association; or (3) the qualifications of the State Boards of Registration for Qualified Opticians in those parts of the British Empire which have already adopted legislation for the regulation of sight-testing opticians.

The general argument of the statement put in is to the effect that in the majority of cases the necessary treatment is sight-testing and the provision of optical appliances, and that this can quite safely be given by the qualified optician without the intervention of the medical practitioner or the ophthalmic specialist.

(Q. 17491.) The overwhelming majority of cases, we would say at least 95 per cent., require solely refractive treatment. . . . Such cases call for no intervention whatever of either the medical practitioner or the ophthalmic specialist, and . . . the qualified ophthalmic optician is the very best person to determine whether any such additional intervention or treatment is necessary.

The witnesses objected to the requirement which they understood to be imposed by the Ministry of Health that an application for ophthalmic benefit must only be considered by an approved society if it is accompanied by the written recommendation of a qualified medical practitioner.

With regard to the training of the qualified optician they made the following statement, and said that the Institute and other optical organisations have repeatedly requested the Ministry of Health to make thorough and searching inquiry into the facilities for training, and the methods of conducting the examinations for optical qualifications for diplomas in refraction.

(App. LX. 43.) The training of the qualified optician is not only intensive with respect to the theory and practice of refraction, but is also extensive concerning matters cognate to and arising out of such practice. Beginning with a basis of mathematics the optical student proceeds to the specific study of geometric optics and the properties of lenses. His further studies include ocular anatomy and physiological optics, on which foundation he is then taught the principles of sight-testing and the correction of refractive errors. Lastly he is taught to detect abnormal cases which require medical or surgical attention, in order that he may fulfil his ethical obligation to the public to pass on for medical advice those cases which require other than optical treatment.

The examinations of the British Optical Association and of the Worshipful Company of Spectacle Makers are, it was stated, conducted by eminent ophthalmic surgeons, refractionists, and physicists, and are admittedly searching in character and comprehensive in scope.

While the members of the Institute work in close coöperation with medical practitioners generally, and with many ophthalmic surgeons, they suggest that the large majority of medical insurance practitioners do not profess to know anything of refraction, and, as fully occupied public servants, are only too glad to avail themselves of the services of the qualified optician.

The witnesses contended that while clinical training in observation is certainly desirable and, in fact, given to the optical student, medical training in a therapeutic

* References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App N. 69," and references to the oral evidence thus—Q. 1369.

sense is not necessary. The following passage¹ was quoted in support of the view that thorough optical training is impossible to the average medical student with the present overloaded medical curriculum.

(Q. 17498.) "The examination of the eye is conducted on principles so different from those employed in ordinary surgical and medical diagnosis that the help to be gained from the latter is practically valueless: the practitioner must, therefore, be prepared at first to approach the subject with his mind wholly detached from medicine and surgery."

The number of qualified opticians is sufficient to give optical benefit to the whole insured population.

With regard to the detection of disease, the sole duty of the optician where he finds evidence of disease is to send the case to a doctor, and the witnesses maintained that the fact that the refractionist is so competent to detect diseases of the back of the eye has led to the discovery of those diseases.

(Q. 17540.) The patient is under the impression that his case is one merely of refraction, and . . . he visits the sight-testing optician in the hope that his case may be merely one of defective sight. The optician at once sees the cause of the trouble or of the symptoms. . . . If an ocular disease be present it is equally recognisable by the ophthalmic optician as by the oculist.

Amongst the recommendations of the Institute were the following: (1) That optical benefit should be extended to every insured person, preferably on a cash basis; and (2) that steps should be taken to set up a departmental committee to consider (a) the need of a national service of refractionists which would work under the National Health Insurance Act; (b) the definition of a standard of qualification for National Health refractionists.

Joint Council of Qualified Opticians.

(App. LXI. and Q. 17618-17704.)

This Council maintains a register of opticians who have passed the recognised examination, and administers a scheme of optical treatment in co-operation with approved societies. Mr. J. H. Sutcliffe, Mr. F. W. Bateman, and Dr. Margaret Dobson were the witnesses. This evidence to some extent covered similar ground to that given by the Institute of Ophthalmic Opticians. The register which is kept has no statutory force, but serves for purposes of disciplinary control. It was drawn up chiefly for the guidance of those approved societies who wanted to make use of the Joint Council's service.

With regard to the proportion of cases which come to the optician for refractive error, and which ultimately require ophthalmic treatment, one of the witnesses said:—

(Q. 17624.) Out of the 35,000 cases last year only 303 were referred for medical treatment. This is less than 1 per cent. On the other hand, I can imagine that the cases presenting themselves at the out-patients' department of an eye hospital or a clinic would, perhaps, include fully 50 per cent. of diseased cases, the reason being that such cases would not present themselves if they were not eye diseases, as nearly all eye diseases are generally obvious to the patients themselves, and therefore do not go to the optician.

Asked to develop the argument for differentiating between the eye and other organs of the body as regards persons entitled to render remedial treatment, the witnesses said:—

(Q. 17628.) With the eye it is simply a case of interposing a certain lens or refractive medium in the air between the eye and the object viewed. The skill of the optician is concentrated upon the determination of the position and the curvature of the lens. He does not add to or take away from, alter the shape or constitution of the eye any more than a cinema lantern operator in focusing the lantern has any effect upon the audience, other than that of making the pictures more or less comfortable as well as clear. Discomfort arising from an incorrect pair of glasses will be greater than any damage that could be done, as the patient can by discarding the glasses voluntarily return to his original state.

In view of this evidence, the question was asked why the witnesses objected so strongly to the

unqualified optician. They said, in reply, that the unqualified man could do great harm, because he has not the training to detect an abnormal fundus. The harm that he may do is in failing to send cases to the ophthalmic surgeon rather than in supplying wrong spectacles.

These witnesses protested, as did the previous witnesses, against the action of the Ministry of Health in requiring an insured person to have a recommendation from a medical practitioner if he needed spectacles, and also against the intention of the British Medical Association to charge any doctors recommending patients to a sight-testing optician with infamous or covering conduct. They readily agreed that the ophthalmic surgeon is a higher authority on the diseases of the eye than the qualified optician, but they said that in turn the qualified optician knew more about the eye than the ordinary general practitioner. The implication in the statements of doctors that opticians lacked the necessary skill could only be due to the fact that those making them had not taken the trouble to ascertain how the qualified optician has been trained.

British Optical Association.

(App. LXII. and Q. 17705-17771.)

This Association is a training and examining body, and confined its evidence to amplifying what had been said by previous witnesses in regard to the schemes of training and examination. Evidence was given by Mr. W. B. Barker, Dr. J. McHoul, and Dr. J. L. Meynell.

During the last 30 years the Association has examined 3661 candidates, and has issued about 250 honours certificates and about 1650 fellowship certificates. The standard required of successful candidates is a high one, and on an average not more than 40 per cent. of the candidates qualify. The Board of Examiners appointed by the Council consists of scientific men, several of whom are ophthalmic surgeons. Its rules and practice are modelled upon those which prevail in the medical and dental professions. The treatment of defective eyes otherwise than by glasses is strongly discouraged by the Association, and the prohibition is enforced where necessary (like other disciplinary measures) by the withdrawal of the Association's certificate of qualification.

With regard to their high standard, the witnesses quoted from a lecture delivered in 1920 by Mr. W. S. Todd, an examiner of the Association, who was chairman of the Examining Boards of different States in America. He said:—

(Q. 17708.) I think it is extraordinarily important that the British Optical Association should be recognised. I have had the privilege of examining for the British Optical Association, and one thing that has surprised me is the very high standard of knowledge. I can speak as a member of the medical profession very much interested in eye work. When I qualified at London University I would not have known the answers to the questions that I had to ask the students at the British Optical Association's examinations.

No difficulty is experienced in securing medical men to act as examiners; on the contrary, the Association have to refuse applications from ophthalmic surgeons because their quota is full. The Association courted the fullest inquiry into their procedure and constitution.

With regard to the United States, the training is conducted at certain recognised State schools and universities in the same manner as at similar colleges of technology in this country. The State Boards of Examiners insist on attendance at those schools before they allow a candidate to sit for the examination; and in certain States the examination of the British Optical Association is regarded as part exemption from those examinations.

For the requirements of an insurance optical service, the witnesses pointed out that as against 500 ophthalmic surgeons willing to undertake the work there were 2500 duly qualified opticians.

¹ The quotation is from *Ophthalmology in General Practice*, by Dr. M. L. Hepburn, surgeon to the Royal London Eye Hospital.

In answer to a question similar to that put to previous witnesses as to the case for differentiating between the eye and other organs as regards persons entitled to render remedial treatment, the witnesses quoted Mr. Bishop Harman in support of the view that the eye is the only organ of the body where by direct observation its internal condition can be fully examined.

(Q. 17723.) As opticians we claim to be physicians, and to supply a proper physical appliance for the correction of a physical error. In our studies we aim, in addition to that, not at a knowledge of pathology at all . . . but a very high knowledge of anatomy and physiology, so extensive that we can immediately detect any departure from normal appearance or function and immediately refer any clients so affected to the trained pathologist. . . The use of the two words "remedial" and "treatment" in the question are misleading. The qualified optician neither prescribes remedies nor does he undertake anything but purely optical treatment.

They also said that the law, as interpreted by the Lord Chief Justice in the case of *Markham v. Thomas*, imposed upon the optician the onus of detecting pathological conditions. Ever since the decision in that particular case the optician has been very anxious indeed, in his own interests, to make sure that he had the skill and ability to detect those conditions.

ROYAL SANITARY INSTITUTE: CONGRESS AT EDINBURGH. JULY 20TH-25TH.

THE Congress began on July 20th with a luncheon in the Students' Union, where Mr. Ewan F. Macpherson (Scottish Board of Health) remarked on the advances in hygiene which marked the progress of the Institute. The formal opening took place in the M'Ewan Hall, the chair being at first occupied by the Marquess of Aberdeen and Temair (a Vice-President of the Institute), who read a letter from the Duke of York regretting his absence. He then introduced the President of the Congress, Sir John Gilmour (Secretary for Scotland), who recounted how many-sided were the health problems of the Government and how well they had been met. He observed that Scotland was particularly easy to manage hygienically as she had always plenty of good water near her great aggregations of population; on the other hand, it was difficult to bring nurses in touch with all patients in the scattered isles. In each of its populous centres there was a university from which knowledge of hygiene was easily spread. Prof. Lorrain Smith was much struck with the personal care people were getting from health officials; the profession was coming again into personal touch with the community on the protective side too, where they seemed for a time to have lost that touch. Alderman W. Phene Neal (London City Corporation) hoped the Congress would be specially successful, as an encouragement to London, where next year's congress was to be held. Resolutions at conferences did do good. He had voted many times asking for municipal slaughter-houses, and now the last private slaughter-houses were to be closed in London. He wondered if people in general realised that 16 per cent. only of our meat was home-grown, only 14 per cent. in London, where only one loaf in ten was of English wheat.

TUESDAY, JULY 21ST.

The *Section of Sanitary Science* was opened by Sir George Newman, the President, whose speech was reported in our last issue. The other papers were on immunity and infectious disease, and great interest was taken in the Edinburgh attack on diphtheria by the Schick test and toxin-antitoxin injection, voluntary as far as the parents were concerned, but few objected; 16 cases of diphtheria had since occurred in children, shown to be positive, but not protected. Immunisation is giving very satisfactory results.

In the *Section of Industrial Hygiene* Captain W. E. Elliot, M.P. (Under-Secretary of Health for Scotland),

who presided, said the capital of a nation was mainly in the bones, muscles, and grey matter of its citizens. Without health no other wealth has value. But if the power of man, as in machines, increases without improvement of his grey matter he will perish like the huge but small-brained *diplodocus* and its congeners. There was great loss of work by sickness; men lost more than women from diseases of the eye and apoplexy, women more than men from diseases of veins and anæmia. Regular repetitive work is monotonous—may not the present passion for betting be the outcome of monotony? When he noted the great advances in health made in recent years, the work of physicians, he was proud that he too had been a physician. He then had to leave, when his place was taken by Lieut.-Colonel F. E. Fremantle, M.P. Sir Thomas Oliver read a paper on *Dusty Occupations and their Effect on the Lungs*. Coal-dust, he said, did no harm; it was the stony, gritty particles that damaged the lung, intensified if bronchial catarrh or tubercle should supervene. Arsenic miners at Schneeberg in Saxony had lately begun to suffer from cancer of the lung (arsenic miners in Cornwall do not), ascribed by Ludwig to radium emanations associated with their dusty operations. Alderman Halsted (Dursley) hoped people would not mind paying a little extra for their coal in order to increase the precautions against dust in mines. Sir Thomas Oliver, in replying, mentioned that the dustiest operation he knew was making millstones in France; the men became very thirsty, drank freely, and at 40 were old men.

Mr. Sydney Tatchell, F.R.I.B.A., read a paper on *Hygiene and Industry*, stressing the importance of attention to the conditions of offices and to the protection of clerks, and telling how he had remodelled a City office, particularly by removing partitions and throwing large rooms open. Councillor Julyan (Poole) said sanitary authorities should take the lead in giving their clerks good working conditions. The difficulty is clerks are not protected by the Factory Acts. Dr. C. S. Thomson (M.O.H., Deptford) said he had been asked to lecture on health at Deptford, which he agreed to do if not less than 500 came to hear, and on these terms he had given several lectures. Dr. W. J. Howarth (M.O.H., City of London) said London offices were extending into basements, very dark and airless, forbidden as dwellings. He thought the present maximum height might be reckoned to the cornice, and the storeys in the roof counted extra. One difficulty was that the people in the dark offices did not themselves complain. Dr. J. J. Buchan (M.O.H., Bradford) said education in hygiene for youths was the proper way of advance. Health visitors told him that domestic servants made the best mothers. It was clear that the others must be trained. Mr. Alexander Johnston, J.P. (North British Rubber Company), read a valuable paper on *Industrial Welfare*, showing how welfare work had become an integral part of management. It increased output, and produced friendliness and esprit de corps. Works councils helped to prevent accidents, and by mutual understanding led to better training.

On Tuesday evening, in the Synod Hall, Sir W. Leslie Mackenzie (Scottish Board of Health) gave a lecture on the *Problem of Psycho-physical Fitness*, which, as Sir George Newman, who presided, said, was, in other words, how to raise a fit imperial race. When, asked Sir Leslie Mackenzie, was a man fit? Fitness is a pure abstraction, but in the war a direct answer had to be given when it was found that of nine men three were fit for any work, two were on a definitely infirm plane, three could do very little, and one was a chronic invalid. We could increase the number of the fit by staying the progress of disease. Tubercle was decreasing, typhoid had been nearly banished. Rheumatism still took a great toll, for nearly one-sixth of industrial debility was due to rheumatic diseases. We should concentrate on prenatal work, infant welfare, and the health of the school child. We might, if we chose, in a generation get rid of diphtheria and scarlet fever. No one need take small-pox unless he wished. So much for physical fitness. Great

advances in psychology had been recently made, and we could work better to secure mental fitness. Besides insanity we had to guard against the obsessions, unreasoning fears, bad tempers. Insanity was itself a disorder of conduct. The child lived in a world of its own, and it was the duty of the teacher to see that it learned without a jolt to adjust itself to life with others. These shocks caused mental conflict. The feeble-minded must be segregated. Mental and physical health were parts of the same problem, the man who neglected either would fail in both. In seconding a vote of thanks to the lecturer, Dr. C. J. Fernandes (Bombay) expressed surprise that England, which had taught India to escape small-pox by vaccination, seemed itself to have lost faith in the specific. Dr. Andrew Balfour moved a vote of thanks to Sir George Newman, who remarked on the benefit of the Congress in bringing together on the same plane the servant, the medical officer of health, and his masters, the members of sanitary authorities.

WEDNESDAY, JULY 22ND.

The *Section of Personal and Domestic Hygiene* was addressed by the Marchioness of Aberdeen and Temair, (the President), who said the great difficulty they still had to face was the apathy of those whom they hoped to benefit. Certainly they were dulled by the dreadful housing conditions against which many mothers were striving heroically. The Royal Sanitary Institute was doing splendid work by increasing popular knowledge. She had had experience of the interest evoked in Ireland by travelling health exhibitions with good demonstrators. Such exhibitions proved a profitable investment for local authorities which wanted support from their constituencies. In practice it was best to start with an attack on tuberculosis, and later to show the benefits of child welfare and the values of foods. She cited the example of the junior Red Cross societies, centred in Paris, which induced children to learn health as a game, thereby speeding up the parents. She had even heard of children in Dublin eager to be the first treated by the dentist. Such was the change wrought. The Playground Association of America for old and young was doing great work. A street with little traffic was closed in the evening, a paid organiser set the children playing. After a few nights the parents began to join in. They got the whole community together to tell stories, to perform plays in the children's summer and winter holidays. This was occurring in 680 cities of the United States, with less crime and less juvenile delinquency as the result.

Dr. Joan Rose (Edinburgh) read a paper on rickets, which elicited from the members a hope that proprietary starchy foods might be forbidden by law, and an intention to combat rickets by better feeding of the expectant mother.

Dr. R. A. Lyster (M.O.H., Hants), in his presidential address to the *Medical Officers of Health*, emphasised the difficulties of dealing with mental defectives, particularly if they married, and said that sterilisation had been recommended by a committee in New Zealand. The greatest hindrance to preventive medicine to-day was the inadequate instruction of young doctors in public health. A course of State medicine was needed which would harmonise the views of the profession with the needs of those who would be working under the National Health Insurance Act. Dr. A. K. Chalmers (M.O.H., Glasgow) said that the tenement system of housing on many floors was characteristic of Scotland, the cottage system of England. But each was now developing along the lines of the other, England building blocks of flats, Scotland providing four cottages in one block, giving each house a separate entrance. They could not dissociate the higher incidence of infectious and respiratory disease in Scotland over that of Wales and England from its system of housing in tenements.

In speaking to a crowded meeting of the *Representatives of Sanitary Authorities* in the City Chambers,

the Lord Provost in the chair, Lieut.-Colonel F. E. Fremantle, M.P., claimed that the Government had been systematically working out a great scheme of health administration. But there was much overlapping in the departments of Government; recruiting, pensions, housing concerned various departments, and each had to decide its own policy. There should be a unified health service under the Prime Minister, like the Committee of National Defence, advisory, not executive. He proposed, and the meeting unanimously passed, a resolution pressing the Government to set up the promised Committee of Civil Research, with special emphasis on its health activities, to be applied by the various departments of Government.

Councillor W. B. Smith (Glasgow) told of the plant set up in Glasgow for providing smokeless fuel which would, he hoped, prove a commercial success, and might in addition solve the smoke problem.

In the evening the Lord Provost, magistrates, and council held a reception in the fine rooms of the College of Art, the guests being entertained with well-sung Scottish and other songs and the music of the "pipes."

THURSDAY, JULY 23RD.

At the Conference of *Port Sanitary Authorities*, Councillor W. J. Harvey, chairman of the Edinburgh Public Health Committee, the President, said that the work of these authorities was so good that attention was rarely directed to it. But it was very important as being the "coastguard of health," and that in its inspection of food from abroad it should exclude all tuberculous meat. The conditions of sailors in ships with 120 cubic feet as the statutory minimum were intolerable. Dr. R. M. Picken (M.O.H., Cardiff) presented a paper on destroying vermin on vessels. Sulphur dioxide can kill both rats and fleas. Hydrocyanic acid is quicker and, as it kills the flea on the rat's body, is useful for identification. The general opinion of speakers seemed to be that hydrocyanic acid, though effective, was dangerous, while sulphur (1½ lb. for every 1000 cubic feet in well-sealed ships) if properly used was as effective. Dr. W. M. Willoughby (M.O.H., Port of London) contributed a most interesting paper on the suggestions of one James Augier, arraigned as a quack, to get rid of plague in London in 1665 by the burning of sulphur. Dr. Milsuzo Tsurumi, of Japan, read papers on Pneumonic Plague, which had again arisen among the tarbagans. Fleet Surgeon W. E. Home submitted a standard death-rate for merchant seamen, and, seconded by Alderman F. Askew (chairman, Hull and Goole Port Sanitary Committee), moved a resolution asking the Council again to represent to the Government that better statistics were needed of the deaths of merchant seamen, who should be brought, for purposes of health considerations, under the care of the Ministry of Health.

The *Popular Lecture* was given by Dr. C. Porter (M.O.H., Marylebone), born and brought up in Edinburgh, who declared that higher developments of health in the future were to be attained by the constant interest of the citizen in his own health, which he will keep up by occasional visits to a doctor for investigation.

FRIDAY, JULY 24TH.

At the *Closing Meeting* it was stated that the attendance had been 1640, a record number. There were 875 delegates sent by 500 authorities.

The *Official Dinner* was held on Friday evening in the North British Station Hotel, the Chairman of the Council, Sir Henry Tanner, being in the chair. Prof. Bostock Hill, proposing the Lord Provost, magistrates, and Council of the City, the most beautiful in the world, spoke of the success of the Exhibition which had been particularly noticeable for its demonstration of women's work in hygiene and of the Scottish apprentices in plumbing. The Lord Provost, Sir W. L. Sleight, thanked the Congress for the encourage-

ment its meeting in Edinburgh had given to preventive medicine in that city. Lord Alness, Lord Justice Clerk, proposed the delegates, and Dr. A. A. Helmi (Cairo) and Dr. J. L. Oluwole (Lagos) replied. Dr. W. J. Howarth proposed the Local Committee and thanked them for their generous and spontaneous welcome. Edinburgh was full of local patriotism and he hoped there might be as much in London next year. Councillor Harvey and Mr. Alan W. Ritchie, chief sanitary inspector, replied.

THE HEALTH EXHIBITION.

The exhibition, well displayed in the Waverley Market, was opened on Monday afternoon by the Lord Provost in the presence of 700 people. Prof. Bostock Hill, who announced the judges' awards, drew attention to the change in health exhibitions. Traps and drains were now taken for granted, and modern hygiene dealt with the individual, the school-child, and the infant. Among the exhibits were many of great value.

Queen Victoria's Jubilee Institute for Nurses showed a bed with a sick patient illustrating model nursing appliances and their substitutes as improvised for poorer homes; also the kitchen of a tenement house prepared for an emergency operation. The stall equipped by the Town Planning Committee of the Edinburgh Corporation showed a map of Edinburgh in the twelfth century; houses in a single row on each side of the High-street and Canongate, each with its garden or close stretching away behind it. The crowded closes of recent days were shown in later maps as the gardens got covered with houses and the growing city became congested within its walls. Messrs. Morrison and Son showed a most interesting enamelled iron bath and basin combined whereby the cost of plumbing was halved. It had been designed for a housing scheme and cost just below £11. There was no "overflow," the plugs of bath and basin being on a short chain, so that they could not both be closed at the same time. Messrs. W. E. Farrar (Birmingham) showed glass coverings of taps, metal concealed, and the taps of various colours to suit the bedrooms in which they might be installed. Also shown was a double trough lavatory for a factory with roses all along for hand-washing, each opened by a foot-tap. Messrs. Chance Brothers and Co. (Birmingham) showed their Calorex glass which very effectively saved the face from the scorching of a large electric light though the light came through; also Vitaglass, which lets electric light through without cutting off the ultra-violet rays. Messrs. Davidson, of Belfast, showed the Sirocco fan, which has done so much for ship, colliery, and other ventilation, and tea-drying, and was here shown removing dust from flues. Mr. James D. Bennett showed his unbreakable school desk made of iron tube, all but the bookboard and seat, in its outline, recalling a bentwood chair (bronze medal). Messrs. Fairbank Kirby (Grimsby) (they also got a bronze medal) showed their cold-drawn cod-liver oil, prepared by the method of Dr. Mellanby. Activated Sludge, Ltd., had working models showing the forcing of air into the sludge, &c., to which the Institute had awarded a silver medal. Edinburgh Corporation Gas Department showed a new gas-oven which, being set at the mark determined as suitable for the cooking in progress, prevented, by a thermostat, the temperature in the oven from rising too high. The British Women's Temperance Association and the British Social Hygiene Council showed excellent literature and diagrams for advancing their propaganda. Messrs. G. W. Harrison and Co. showed their Silent Harriap flushing cistern. A solid piston by its upward movement lifts enough water to set the syphon action going, and when it is released a copper shutter on the piston opens and allows the rest of the water to complete the flush. As the shutter and its bearings are of copper and are fixed in the piston when it is cast, it is held that the system will never be eaten away by chemical action nor require repair (silver medal). The Lacre Motor Car Co. (King's Cross, London) showed a street-sweeping brush mounted in a motor body with only a single wheel behind to facilitate sweeping out corners (silver medal). Edinburgh Corporation Electricity Department showed the baking of bread in an electric-heated oven. A remark to the manager of the stall suggesting that electricity was too expensive for cooking and other household heating, led him to say that of course it depended on the price of current, but that a county asylum had had an interesting experience. It made its own electricity originally for lighting with carbon filament lamps, but as these were replaced by metal filament, and these by gas-filled lamps, there was so much electricity to spare that the kitchen, cooking for 1000 persons, patients and staff, was outfitted with complete equipment, ovens for bread baking, fish fryers, vegetable steamers, roasting ovens,

&c., that this was found to be practicable with only its existing generating plant, and the change to electricity has ever since given complete satisfaction. At stall No. 54, North British Rubber Co., Ltd. (Edinburgh and London), was seen a novel and easily cleaned teat for feeding-bottles. There is no teat; that is replaced by a grooved strip of rubber which, doubled, passes through a slot in the dome of the cap; the child has the loop in his mouth and sucks the milk easily through the channel formed by the grooves. Once the knack of adjustment has been learned there is no difficulty in cleaning the teat and putting it again in use. Silver medals were awarded to Messrs. Southall, and to Hoover, Ltd., for their suction sweeper. Messrs. Parsons, of 315, Oxford-street, London, showed panels of their enamels of wonderful brilliance which won a bronze medal.

(To be continued.)

Reviews and Notices of Books.

SURGICAL TREATMENT OF PULMONARY AND PLEURAL TUBERCULOSIS.

By J. GRAVESEN, M.D., Medical Superintendent, Vejle fjord Sanatorium, Denmark. With a Foreword by Dr. S. VERE PEARSON. London: John Bale, Sons and Danielsson, Ltd. 1925. Pp. 155. 10s. 6d.

THERE are several books and countless papers on the surgical treatment of pulmonary and pleural tuberculosis, but most of them are out of date, so rapid has been the advance in our knowledge of this subject. Dr. Gravesen's book accordingly fills a gap.

It is proper and fitting that this book should have come from Vejle fjord Sanatorium, for it has probably done more than any other institution in the world to promote the collapse treatment of pulmonary tuberculosis, and its first chief, Prof. Saugman, Dr. Gravesen's predecessor, was a conservative revolutionary, who converted the Dettweiler conception of masterly inactivity in the sanatorium into an elaborate system embracing surgery as well as medicine. During the last 20 years of his life Saugman was untiring in his efforts to bring to perfection artificial pneumothorax and, later, the operation of extra-pleural thoracoplasty, thoracoscopy with cauterisation of pleural adhesions, apicolysis, and many other daring incursions into the surgery of the lungs. Dr. Gravesen, who served as his assistant for many years, has made good use of the ample material and experience at his disposal, summarising in orderly fashion the essentials of his subject. Only by a severe elimination of unimportant details could he have condensed his matter into 155 small pages; and to those who during the past decade have attempted to struggle with the truck-loads of literature on this subject, this achievement of condensation is most impressive. The description of the technique of the induction of a pneumothorax should be read by all who would practise this treatment, and who may be tempted to approach it with imperfect equipment. A considerable part of the book is devoted to pleurisy, and as tuberculous pleurisy with effusion is often encountered by the busy practitioner, he would do well to learn the most modern methods of treating this condition, improper treatment of which may seal the patient's fate many years later. The procedure which the author recommends in such cases is gas replacement which allows of evacuation of the peccant fluid and yet maintains that compression of the lung which is most desirable at this stage. It would be interesting to learn in what proportion of cases of tuberculous pleurisy with effusion in Great Britain this simple operation of gas replacement is practised.

Dr. Gravesen duly emphasises the importance of combining sanatorium treatment with surgical activity instead of allowing the one to become a

competitor of the other. To encourage an alliance instead of a competition between these forces he foresees the need for introducing hospital-like conditions into the sanatorium, the conventional traditions of which must be modified so that in the future it will provide not only fresh air and rest, but also such widely different remedies as surgery, artificial light, chemo-therapeutic drugs, and whatever else medical research may give us in the future. In connexion with the author's reference to chemo-therapy, it should be noted that he has used sanocrysin since April, 1924, without having lost faith in it, and he discusses the possibilities of combining or interchanging sanocrysin and surgical treatment. Sanocrysin is, of course, still on trial, but the surgical treatment of pulmonary and pleural tuberculosis has passed the experimental stage, and Dr. Gravesen's book will remain a standard work on this subject for years to come.

TETANY.

La Tétanie Infantile. By R. A. TURPIN. Paris: Masson et Cie. 1925. Pp. 224. Fr.16.

THIS is a work of considerable importance and interest, not all of which is indicated by the title. The scope of the book is by no means limited to carpopedal spasm, but extends to most of the symptoms commonly described as spasmophilic (*tétanie latente*), and the author's observations have important bearings on the whole question of the nature of rickets. The first part of the book consists of a summary of the numerous researches which have been carried out in recent years on metabolism in tetany, following parathyroidectomy and arising from other causes. The question of calcium metabolism naturally occupies a large part of this chapter; Dr. Turpin demonstrates the conflicting results of the experiments referred to, and asserts that tetany can no more be accounted for by a pure hypocalcæmia than by excess of guanidine in the blood.

The author's own observations are presented in the form of a comparative study of three forms of tetany: (1) arising after parathyroidectomy; (2) produced by voluntary hyperpnœa; (3) occurring in children, usually associated with rickets. The investigation was principally concerned with the alterations which take place in the electrical reactions of the affected neuromuscular units, and in the calcium metabolism. The author considers that the most characteristic feature of the electrical reactions is alteration of the chronaxie. In latent infantile tetany (spasmophilia) this takes the form of instability, usually increase. In tetany following removal of parathyroids or evoked by voluntary hyperpnœa there is a very considerable increase, which is present before the spasm develops, rises to a maximum during the attack, and diminishes as the spasm subsides. The changes which are found in the blood in tetany are described in detail, and illustrated by tables showing the hydrogen-ion concentration and calcium-ion content in a series of cases. The author's view is that the essential change which precedes the spasm in all forms of tetany is an alteration of the acid-base relation in the direction of hyperalkalinity, resulting in a fall in the ionic-calcium content of the blood, though not necessarily in the total calcium content. Treatment is to be directed to the correction of this alkalinity, and for this purpose ingestion of ammonium chloride and exposure to ultra-violet rays are the most effective measures. On the exact relation between tetany and rickets the author is somewhat reticent, though rickets appears as an almost constant feature of the cases which he describes; his work may perhaps strengthen the opinion of those who regard tetany as essentially a manifestation of rickets. A problem of equal interest is presented by the relation of neuropathic heredity in spasmophilia with the biochemical processes described in this work.

The value of the book is greatly increased by a comprehensive bibliography.

MANUAL ON MIDWIFERY.

Sixth edition. By THOMAS WATTS EDEN, M.D., F.R.C.P., F.R.C.S., Consulting Obstetric Physician to Charing Cross Hospital; and EARDLEY HOLLAND, M.D., F.R.C.P., F.R.C.S., Obstetric and Gynecological Surgeon and Lecturer on Obstetrics and Gynecology, the London Hospital. London: J. and A. Churchill. 1925. With plates and 393 illustrations in the text. Pp. 704. 21s.

THE preparation of the completely revised sixth edition of this standard text-book of midwifery has been entrusted by the author to Dr. Eardley Holland, who is responsible for the many alterations in it. Although much new matter has been added and certain parts rewritten, it has been found possible to reduce the original number of pages by 40, a relief for which the student will be grateful. The book is now divided into nine parts. Parts VII. and IX. are new. The former deals with "Diseases, Injuries, and Death of the Fetus," asphyxia neonatorum being now included here. This is a valuable addition to the book as it represents the results of Dr. Holland's well-known investigations on this subject. He makes a strong plea to the medical profession for the adoption of the terms "live-birth" and "dead-birth" in preference to "still-birth." Pulmonary respiration and not cardiac beat is taken as the sign of the former, whereas death of the foetus before it has breathed, even if its heart is beating at birth, is adopted as the definition of "dead-birth." In Part IX. a brief description is given of the statistics of maternal mortality, followed by an excellent account of the methods and purpose of antenatal supervision. This important section is wisely placed at the end of the book, for the student at this stage will be the better able to appreciate the great advantages of efficient antenatal care, not only to the pregnant woman, but also to the practitioner.

The management of normal pregnancy is dealt with in Part I., where new sections have been added on the functions of the placenta and on the changes in the maternal metabolism during pregnancy. Attention is here drawn to the diagnostic value of X rays, not only in the differentiation of an early pregnancy from such conditions as a vesicular mole or fibroids, but also in the determination at full term of the presentation and lie of the foetus, particularly in hydramnios or multiple pregnancy. It is also of value in excluding prematurity twins or a monster in cases where a Cæsarean section is contemplated, for anencephaly is easily demonstrable, and the degree of the ossification of the bones will give some idea of the foetal age. Three illustrative radiograms are admirably reproduced, the most interesting of which depicts the spine and leg of a foetus at the sixteenth week. This may well be the earliest positive sign of pregnancy, but we doubt whether a negative result at this stage is of much value. The section dealing with the toxæmias of pregnancy, including eclampsia, has been largely rewritten, and Dr. Holland makes an impartial résumé of modern views. For himself he still regards routine clinical experience as a more reliable guide than biochemical investigation. Part IV. (Abnormal Labour) now includes occipito-posterior positions with extension of the head, this position being diagnosed "when the second stage of labour has lasted three hours—or less if the powers of labour have begun to fail—and there is no sign of forward rotation occurring," the position before this being dealt with in Part III. (Normal Labour). This division may perplex the tyro. A welcome description is given of Buist's pad and binder method of rotating the occiput during the last few weeks of pregnancy.

The subject of puerperal infection is dealt with in a thorough and up-to-date manner. The old division into sapræmia and septicæmia is discarded, and the infections are grouped into slight and severe, the latter with or without secondary septicæmia. "Primary septicæmia" is reserved for those fulminant cases in which the infection becomes generalised from the first. Great stress is laid on careful bacteriological

examination of the uterine contents, and an excellent description is given of the technique. Dr. Holland is not convinced that auto-infection plays any part in the severer forms, but he assigns a definite place to latent gonococcal infection. The portion of the book dealing with Caesarean section includes a short description of the two lower-segment operations which, the author claims, are especially suitable for cases in which infection has occurred or is suspected. There is less risk of adhesion, and so far no case has been reported of rupture of a scar in the lower uterine segment; whereas in a collective follow-up investigation into 1000 cases or more carried out by Dr. Holland in 1920, it was found that rupture of the scar occurred in 4 per cent. of cases after the classical operation.

This edition of the manual bids fair to maintain its position as one of the best students' text-books of obstetrics.

MEDICAL ELECTRICITY FOR NURSES.

By HAROLD WIGG, Radiographer, Royal Buckinghamshire Hospital. London: The Scientific Press, Ltd. 1925. Pp. 196. 6s.

THIS little book has been written to assist the nurse in an electrical department to acquire a working knowledge of the uses of electricity for medical purposes. In less than 200 pages the author deals with physical principles, the sources of current electricity, the effects of electricity on the body, faradic, galvanic and sinusoidal apparatus, the methods of applying these currents, medical and surgical ionisation, muscle and nerve testing, radiant heat and light, X-rays, static electricity and high-frequency, diathermy, and the electrical circuits in certain surgical instruments such as the cystoscope. An index of electrical treatment concludes the book. We fear that in attempting to convey to the average nurse an intelligible exposition of all branches of medical electricity and of the relevant parts of chemistry and physics in so small a book the author has undertaken an almost impossible task. He has written clearly, and in a manner well suited for the worker with some preliminary knowledge of science. For the nurse a more colloquial description and the frequent use of analogy would have been helpful.

LATIN ON THE DIRECT METHOD.

By W. H. D. ROUSE, M.A., Headmaster of the Perse School; and R. B. APPLETON, M.A., Chief Classical Master at the Perse School. London: University of London Press, Ltd. 1925. Pp. 226. 7s. 6d.

IF the teaching of languages, alive or dead, on the principles so lucidly expounded in this book were to become universal, we should hear less about time wasted on the study of the classics, and have gone far to roll away a national reproach. The results actually obtained by the direct method in the Perse school, as here exemplified, are astonishing, and the book deserves to be read by all concerned in education. It is plain that for the fortunate boys in that school the learning of Latin is not attended by terrors, but is full of lively interest.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVIII., No. 3. Pp. 397-539.—The Action of Sensitised Antigen in the Production of Specific and Isophile Hemolytic Immune Body, by T. Iijima (Tokyo). There has been a good deal of difference of experience as to whether antigens saturated with specific immune body act as efficient stimulants for antibody production, whether in other words the antigen-immune-body combination will dissociate in vivo like a neutral toxin-antitoxin mixture. The author's experiments with hemolysins show that fully saturated red corpuscles have a very small antigenic effect.—The Nature of the Acquired Resistance to Bacteriophage Action, by F. M. Burnet (Melbourne).

If a large bacterial population is acted on by a bacteriophage a small number of individuals escape the lytic action and give rise to similarly resistant descendants. d'Hérelle interpreted this as an acquisition of immunity to a parasite. The author shows that this is unlikely and explains the phenomenon in terms of the bacteriophage being a catalyst for the normal autolytic ferments which are concerned in fission, showing that the acquisition of resistance is accompanied by the production of long undivided bacillary forms. In a second paper the idea is developed that the differences between different bacteriophages are due to the readiness with which they are adsorbed on to the bacillary enzymes.—Experimental Pneumococcal Infections of the Lung, by J. F. Gaskell (Cambridge).—The Thyroid in Experimental Tuberculosis, by S. R. Gloyne (London). The thyroid in man is surprisingly immune to tuberculosis; the same is true of the guinea-pig, less so in the rabbit. Thyroid preparations have no ill-effect on tubercle bacilli in vitro nor any curative action on infected animals, nor is the natural resistance of the white rat influenced by thyroid medication. The immunity of the gland is possibly due to some anatomical cause.—Attempts to Transmit Epidemic Encephalitis to Rabbits, by J. H. Dible (Manchester). Failed in ten cases. A fresh pitfall of abnormal appearances in the brains of normal animals is described.—Immunological Notes, by A. T. Glenny, C. G. Pope, H. Waddington, and U. Wallace (Beckenham). The ratio between the in vivo and the in vitro antitoxin values is not constant as Ramon claims. In making Ramon tests care must be taken not to be misled by a non-specific flocculation which may occur at a point in the titrations far removed from the true value. The relative strength of two batches of antitoxin may vary according to the toxin used for titration. Many diphtheria toxin-antitoxin mixtures can be greatly diluted without much loss of antigenic efficiency; beyond a certain point there is no advantage in increasing the dose. Strong diphtheria toxin cannot always be relied upon to keep; dilutions made up ready for the Schick test are very easily destroyed by shaking with air; half-full bottles cannot be transported safely even a short distance. Phenol of about 5 per cent. strength destroys relatively more antitoxin than toxin in a mixture which may be thus converted from a neutral to a toxic preparation; apart from this toxin-antitoxin mixtures are stable enough. High-grade tetanus antitoxin is best produced by giving horses a few preliminary doses of toxin and then resting them for at least a month, after which they rapidly respond to further doses.—The Excretion of Water Urea and Chlorides in Experimental Oxalate Nephritis, by J. S. Dunn and N. A. Jones (Manchester). In the tubular nephrosis produced in rabbits by oxalate poisoning urea retention may be relieved by the copious administration of water and the kidney has no difficulty in excreting extra salt at the same time. It is suggested that the urea retention is due to the damaged tubules being unable to prevent the indiscriminate reabsorption of the glomerular filtrate and all its constituents.—The Relief of Experimental Arterial Anoxæmia by Compressed Air, by C. F. Nelson and P. Woodard. Anoxæmia produced by unilateral pneumothorax or the intratracheal injection of gum solution can be largely removed by compressed air at about 21 lb. pressure.—The Preparation of Certain Substituted Ureas and their Use in the Treatment of Trypanosomiasis, by T. H. Fairbrother, F. A. Mason, W. H. Perkin, and A. Renshaw (Manchester). A preparation made according to Fournieu's formula for Bayer 205 had marked trypanocidal properties on *T. equiperdum* in mice.—An Improved Method of Mounting Pathological Specimens in Flat Celluloid Cases, by C. M. Acland (Cardiff).—The Temperature of White and Black and White Rats, by C. Price-Jones (London). Useful data for 200 normal animals; the range is from 97° to 103°.—Sarcoma of the Ampulla of Vater without Jaundice Leading to Acute Pancreatitis, by H. H. Moll (Leeds).

THE LANCET.

LONDON: SATURDAY, AUGUST 1, 1925.

HOSPITAL ADMINISTRATION IN ITS BROADER OUTLOOK.

It is 50 years since the Public Health Act of 1875, the charter of English preventive medicine, was placed on the Statute Book. A long struggle had led up to its enactment and the way for its passage had been paved by the work of pioneers who were not always popular. The efforts of Lord SHAFTESBURY, the factory legislation of the forties, the writings of CHARLES KINGSLEY, under the name of Parson Lot, and the steady education of public opinion by a host of other writers and speakers culminated in a new outlook. Finally, at the end of this period the discoveries of PASTEUR and LISTER revolutionised our views on infective disease. To read through the clauses of the 1875 Act and the statutes, such as the Rivers Pollution Prevention Act, which followed immediately after, is to get a historical view of the effort which was made by the sociologists of the day to attain to a healthy standard of living. With the passing of the Public Health Act there came to an end the age-long practice of *laissez faire*, which held that a man might do what he liked with his own, and that his doings, even if inimical to health, were no concern of his neighbours and least of all of the State. Throughout this initial period of reform we may trace three main lines of progress: (1) the attempt to make our expanding industrial system safe and healthy for the workers; (2) the endeavour to improve the sanitation of rapidly growing townships with their tenement dwellings—the word *slum* is a product of this period—which the new industries were calling into existence; and (3) the task of applying the new standards of cleanliness, sterilisation, disinfection, and isolation, which the work of PASTEUR and LISTER had introduced into infective and epidemic disease. Alongside these reforms there had been slowly growing up a public conscience on the question of poverty and destitution, and it is the modern reflection of this feeling which finds expression in the Social Service Department of the hospital.

No country in the world has witnessed such efforts as are made in our islands to relieve sickness and poverty by voluntary means, but much of this effort can only be described as indiscriminate charity; and it was inevitable that there should follow in the wake of the sanitary reforms, marking the closing years of what ARNOLD TOYNBEE termed the industrial revolution, an attempt to understand and relieve the causes and results of poverty. About the time of the passing of the Public Health Act the development of the University Social Settlements under the influence of the late Canon SAMUEL BARNETT and TOYNBEE, and the foundation of charity organisation societies, began to emphasise the importance of understanding these questions. To use the words of Canon BARNETT, it was necessary that "citizens should learn to understand the lives of each other," and so, gradually, the State came to realise, through the pressure of hard facts, that the care of its less

fortunate citizens could not be left to indiscriminate charity. The legislation of this century, therefore, has seen a great increase in all measures for sociological amelioration. The care of the blind, the deaf, the epileptic, the feeble-minded, and the insane was an essential first step in the work in which our example has been followed by other nations, but we have now gone much further and have recognised that the school child, the child of pre-school age, and the expectant mother must also be the concern of the State if a healthy standard of living is to be maintained. It would be difficult to assess in actual figures the value of the great voluntary hospitals of this country in this movement, but in medical education, in research, in the high standard of clinical practice which they have maintained, the hospitals have made no small contribution. Great as these contributions have been there remains much yet to be done. Clinical practice and surgical treatment have been raised to a high level, but there is still a vast work in front of us in correlating the sociological causes of disease. In this matter the hospitals may have been slow to act, but their hands have always been over-full. It may perhaps be considered that this particular phase of a vast set of problems lies outside the scope of the hospitals' work, but at every stage in the progress of medical research, especially in clinical research, it becomes clear that the patient's habits and manner of life, his environment, his work, and his opportunities for a healthy life are intimately relevant to his treatment.

A reference to the reports of hospital almoners—those most important officers of the Social Service Department of the institution—makes this clear, especially in special departments where a preliminary sorting of cases has already taken place. The more carefully cases are followed up by home visitation and inquiry, the more it is realised that the financial side of the work forms only a small part of the Social Service Department of a hospital. It is true that the prevention of abuse soon became one of the essential needs and cardinal rules of the early days of hospital administration, but a great deal has happened during the last quarter of a century, especially as a result of the war, to alter the point of view of financial inquiry. Indeed, to a certain extent, it can be said inquiry into hospital abuse may obscure real sociological issues. The work of the Social Service Department, if it is to be interpreted rightly, is an essential part of clinical research, and from the point of view of medical education the sociological background must have a bearing on all teaching, whether clinical or preventive. General practice to-day is becoming more and more preventive and educational in its outlook, and the youngest student sees the narrow limits of the palliative measures with which a past generation had to be content. Thus the outlook is steadily changing. In the past too much stress has been laid on rules and regulations, especially negatives—the things which patients must not do. Nowadays, stress is being more and more laid on the positive educational side of hygiene. The modern patient has had an opportunity of acquiring a knowledge of elementary hygiene and physiology in school and in the popular science press, and he is keen to know the reasons for things and able to appreciate their importance and significance. The period under review has seen the introduction of many new words in sociological literature; preventive medicine is by no means the happiest of these. We need a term which is wide in its embrace of all the problems and is educational and constructive in its outlook.

CHOLECYSTOGRAPHY.

THE application of X rays to the problems of diagnosis finds ever new fields of usefulness. One of the latest is the mapping out of the gall-bladder or cholecystography. The investigation of hepatic function by means of dyes is not itself a new method, for it was introduced 12 years ago by ROWNTREE, HURVITZ, and BLOOMFIELD,¹ who administered phenoltetrachlorophthalein intravenously and noted the rate of its appearance in the faeces. The substance is removed from the circulation by the liver and excreted in the bile with the result that, in conditions where the excretory function of the liver is impaired, the appearance of the dye in the bowel becomes delayed. On account of the variable rate of action of the intestines in different individuals the test as devised by ROWNTREE was found unsatisfactory, but MCNEIL,² AARON, BECK, and SCHNEIDER,³ FRIEDENWALD and GANTT,⁴ and other observers made use of the duodenal tube to recover the dye, and were able to establish the method as a useful one. In normal persons the dye, given intravenously, appears in the duodenum in about 13 minutes. More recently, FIESSINGER and LONGCHAMPT,⁵ working in Prof. CHAUFFARD's clinic, have further modified this test. Giving the dye intravenously, they take a sample of blood from the patient 20 minutes later and, by a colorimetric method, observe how much of it has been withdrawn from the circulation. They point out that the kidney as well as the liver serves as a path of excretion for the substance, but, as the amount lost by this route is small, the source of error is not serious. They do, however, criticise the method in that it gives information concerning one aspect only of hepatic function—namely, the excretory process. The great practical value of the method dates, however, from the discovery by GRAHAM that radiograms of the gall-bladder could be obtained by the use of this and similar substances. GRAHAM and COLE⁶ showed last year that the intravenous administration of the sodium salt of tetrabromophenolphthalein or tetraiodophenolphthalein led, in the course of a few hours, to the appearance of an opacity in the gall-bladder enabling that organ to be examined radiographically.

Clinically this method of examination, here not improperly known as "Graham's test," has been exploited with good effect at the Mayo Clinic, and Dr. RUSSELL D. CARMAN communicated to the recent International Congress of Radiology a paper (which appeared in THE LANCET of July 11th) setting out the technique adopted, and giving some noteworthy figures of its employment in the diagnosis of diseases of the gall-bladder. At the Mayo Clinic this method of investigation has been employed in more than 1100 cases during the past 15 months, and in a large number of the cases the findings have been put to the test of operation. The substances used in Dr. CARMAN's observations were sodium tetrabromophenolphthalein and sodium tetraiodophenolphthalein, given either by oral or intravenous administration, and the gall-bladder region was examined at certain times after the administration—namely, at the fifth, eighth, and twenty-fourth hour after giving the dye. The intravenous method was found to require strict

preparation and diet during the period of examination. It gives rather more dense shadows than the oral method, but it not infrequently produces some local or systemic reaction, which may be severe. The oral method does not entail any special preparation or diet, and does not give any serious systemic reactions, though nausea and purgation sometimes occur. These effects are less common with the bromine salt than with the iodine. In consequence, Dr. CARMAN at present advises the oral use of the bromine salt as a routine method, but he uses the iodine combination intravenously to check the results in doubtful cases. The usual appearance in normal cases is an increase of intensity of the shadow followed by a diminution. In regard to the results obtained in diseased conditions, Dr. CARMAN finds that failure of the gall-bladder to fill with the dye sufficiently to cast a shadow is the most important abnormal indication, though persistent faintness of the shadow is almost equally suggestive of abnormality. Mottling of the shadow may be due to gall-stones; in some cases the shadow of the stones is denser, in others lighter than that of the dye; but gas in an overlying section of bowel may give an appearance of misleading similarity. As might be anticipated, the positive findings are of more value than the negative, and normal appearances with cholecystography must not be taken as excluding disease of the gall-bladder.

The Mayo Clinic results are sufficiently striking to warrant more extended trial of the method, which promises to give results of equal value to pyelography and to the method of investigation of the kidney by X rays after injection of oxygen into the peri-renal tissues. Why certain dyes should be opaque to the X rays remains obscure, but it would appear that it is the sodium and halogen elements in them that are responsible, the linkage with phenolphthalein serving to form a molecule which is excreted by the biliary tract. Further inquiry in this direction might also repay the trouble.

LABORATORY RESEARCH IN MENTAL DISEASE.

IN his presidential address to the Medico-Psychological Association of Great Britain and Ireland, which we print in abstract on another page, Sir FREDERICK MOTT enforced on medico-psychologists the duty of practising medicine in its broadest sense. Faced with an abnormal psychic state, inquiry should be made after a bodily condition which might be acting as cause or contributory factor. The annual report of the laboratory under the direction of the Birmingham Joint Board of Research for Mental Diseases, which has just been issued, gives a good example of such inquiry. The work of the laboratory during the year ending March, 1925, has been to develop lines of research upon the basis of endocrine functions; special attention has so far been directed to the thyroid gland, and details are given of the basal metabolism determinations and the analyses of thyroid gland for iodine content. There has been an inquiry into the action of certain hypnotic drugs upon animals with respect to the physiological action and the effect upon the general health and well-being of the animals. Routine serological, bacteriological, and chemical work has been done for the clinical staff of the Rubery and Hollymoor Hospitals; chiefly from the gynaecological, ear, nose and throat, and dental departments, and also for the purpose of investigating the occurrence of a few cases of typhoid in each institution; this latter work is still in progress. One hundred and thirty-four specimens from the Monyhull Colony have also been examined, especially in relation to the recent dysentery outbreak. Other

¹ Rowntree, Hurvitz, and Bloomfield: Bull. Johns Hopkins Hosp., 1913, xxiv., 327.

² McNeil: Jour. Lab. and Clin. Med., 1916, i., 822.

³ Aaron, Beck, and Schneider: Jour. Amer. Med. Assn., 1921, lxxvii., 1631.

⁴ Friedenwald and Gantt: Amer. Jour. Med. Sci., 1923, clxvi., 519.

⁵ Fiessinger and Longchampt: Presse Méd., 1925, xxxiii., 873.

⁶ E. A. Graham and W. H. Cole: Jour. Amer. Med. Assn., 1924, lxxxii., 613 and 1777.

work includes post-mortem examinations, the collection of material for histological and chemical examination, and of specimens likely to be of interest for future study. In view of the probable association between chronic sepsis and disturbed endocrine function the bacteriological work has become part of the research and has largely occupied the resources of the laboratory. The determination of the basal metabolism in the special respiration chamber has been improved upon both in procedure and in refinements of the apparatus, which has been perfected in the laboratory. There have been 60 determinations made of 22 patients and 11 nurses; and of these 4 patients and 1 nurse showed metabolism exceeding 110 per cent. of the standard, the highest being 125 per cent., and 8 patients and 4 nurses showed metabolism below 90 per cent. of the standard—the lowest, a patient; being just under 50 per cent. of the standard; the remainder are within 90–110 per cent. of the figures given in the Harris and Benedict tables for standard metabolism. One patient with defective metabolism was examined on ten occasions when only slight variations were found between 60 and 70 per cent. of the standard. The work will be made the subject of a paper for publication.

The investigation of the iodine content of thyroid glands previously carried on at the pathological laboratory of the London County Mental Hospital at the Maudsley Hospital has been transferred to Birmingham and is still in progress. Although a number of methods for the estimation of iodine are published, none of these has proved entirely satisfactory, and an original method for the accurate quantitative estimation of the iodine has been devised. It is found that there is a great variation in the iodine content—from $1\frac{1}{2}$ to 44 milligrammes per gland—which corresponds fairly well with the result previously obtained as to the extreme limits but is more accurate in respect of individual cases. The chemical results are being correlated as before with the histological investigation in each case. A large number of organisms have been isolated and classified for reference by their sugar reactions. Organisms of the typhoid-dysentery class are also tested by their agglutination reactions; a few animal inoculations have been made for diagnostic purposes. Examination of sera for typhoid agglutination is to be extended to cover all the patients in the two institutions. A large number of vaccines prepared from carefully isolated identified and purified organisms are now on trial. Three cases of puerperal sepsis have been investigated by the laboratory—one of which showed at autopsy a thrombosed inferior vena cava with a generalised infection of *B. lactis aerogenes*; another showed during life a bacteræmia of a Gram-positive coccus. From this organism a vaccine was prepared and the patient's brother immunised in preparation for a blood transfusion; transient good results in this case followed injection of aseptic guinea-pig serum-complement in conjunction with polyvalent anti-streptococcal serum.

It is interesting to note in view of the demonstrated sepsis of the mouth and nasopharynx that 23 of 36 specimens of test-meals showed no free hydrochloric acid. Examination of the faeces has revealed many varieties of organisms. Streptococci are present in many cases, occasionally in pure culture. *B. typhosus* has been found in six cases, para B in one case, *B. aertrycke* (mutton) one case, *B. dysenteriae* "Y" in two cases (the latter from Monyhull). A large number of organisms other than *B. coli* are often found, which do not fall into the pathogenic groups by reason of their sugar reactions. *B. friedländer* often occurs in groups of cases—e.g., 9 out of 20 in one ward, and *B. cloacæ* has been found in a blood culture in one case on two successive occasions: this suggests that organisms usually considered "normal," or at least non-pathogenic, may multiply and cause disturbance in debilitated patients such as those who are commonly met with in mental hospitals. A large amount of material has been collected for histological examination, but on account of pressure

of other work it has not been practicable to proceed far with this department at present. A number of blood-sugar analyses have been made of specimens taken from hospital patients in the fasting stage with a view to demonstrating cases of definite hypoglycæmia. The sugar was determined by a modification of Calvert's method. Of 78 specimens tested, 9 gave results of over 0.12 per cent. of glucose, and 29 gave results of less than 0.09 per cent., including 14 under 0.08 per cent. Other work in progress includes the quantitative estimation of the fat, lipid, and cholesterol content of suprarenal glands obtained at autopsies and correlations with micro-chemical tests and histological structure.

The value of this steady scientific research into the physical disorders underlying mental disease is unquestioned. It is to the laboratories of mental hospitals that psychiatrists are looking for some explanation of the tangled skein they seek to unravel. At present the work is too new for far-reaching conclusions to be drawn, but before long it should be possible to correlate the findings of the various workers.

Annotations.

"Ne quid nimis."

HYGIENE IN FACTORIES.

LAST week we noted some of the more general aspects of the report of the Chief Inspector of Factories and Workshops for the year 1924. The experiment of employing women and young persons on the system of two shifts permitted by the Act of 1920 has not had a fair trial yet owing to trade depression. So far, however, as it has been adopted, difficulties of enforcement have not been experienced, some economic advantage has followed, and, in certain cases, workers have expressed a preference for this method of work. For the most part permission to work the system has been made provisional on good welfare conditions. When trade improves this interesting system will be carefully watched. The general progress in the welfare movement now fixes it as firmly established; it is spreading and broadening; dental surgeries are being started; whole time nurses are being employed; in some cases medical service is being retained; in addition to the more usual canteen and recreational activities.

Sir Thomas Legge tells of the close eye kept by his medical staff for new occupational risks as novel processes are started, and for any relaxation in efforts to prevent well-recognised industrial disease. Lead poisoning has increased, largely due to ship-breaking in which fumes from old paint arise as the plates are cut by the oxy-acetylene flame; protection here is particularly difficult. A method of detecting lead absorption by the presence of punctate basophilia, which promises to be of practical value, has been worked out by Dr. A. Sellers. The recognition of cancer among mule-spinners has led to associating the occurrence of skin epithelioma with exposure to oil in other occupations, such as machinists, engine tenters, and brick pressers. Among the spinners 20 years was the minimum exposure. There seems no reason why, now that the danger is recognised, these cases should not all be avoided. Various investigations have been made into the occurrence of dermatitis, due to dyes, alkalis, oil, sugar, nickel salts, and other things; "barley itch" among dock labourers was ascribed to *Pediculoides ventricosus*. The campaign against dust, particularly that of fine silica, is being actively pursued; a recurrence of weavers' cough, a form of aspergillosis, is reported.

The number of girls, 192,217, medically examined for certificates of fitness again exceeds that of boys, 160,534; it raises the question as to what is happening to the boys. Welcome news is given regarding the provision in all factories for first-aid, made compulsory

by Section 29 of the Workmen's Compensation Act, 1923. Response to the new requirement has been astonishingly rapid and marked by goodwill and general interest; the standard of equipment is high and such ancient and dangerous remedies as carron oil are being rapidly discarded. Education in its use is still needed, as we read that of 375 septic cases investigated, 216 had not had first-aid treatment. Notwithstanding the rapid increase in the use of electricity, accidents from this cause keep surprisingly low. The remarkable fact is reported that severe accidents at very high pressures, although causing permanent injuries, may not be fatal; thus out of 37 such cases only six were fatal. A special investigation into dust arising in dealing with grain cargoes throws the blame for the acute irritation of the upper air passages, which is experienced, upon fine hair particles derived from the grain to the exclusion of contamination with dirt and debris; the application of efficient exhaust plant should prevent escape of the dust. Recommendations are made accordingly.

The report concludes with an interesting account of the Government anthrax disinfection station for wool and hair at Liverpool. Notwithstanding abnormal difficulties during the trial period, the disinfection process which depends upon formaldehyde has proved unquestionably efficient. No case of anthrax has resulted from, or been imputed to, any of the materials disinfected, even though, from 1921-24, the material amounted to 8,300,000 lb. The cost per pound in 1924 was only 1½d. Unfortunately the process is not being adopted in other countries. In England the industrial anthrax problem has always concerned wool; in other countries hides and skins are more to blame. Thus in the nine years 1912-20 there were 372 cases from wool, as against 156 from hides and skins, but for 1922-24 there were only 52, as against 54. Wool sorters' disease seems within sight of abolition with us.

THE PLURAL OF VIRUS.

A GREAT pathologist once said that he thought the most fruitful and inspiring moment of his undergraduate career was his first introduction to "nucleated blastema" in which he ever afterwards found comfort at moments of stress. Everyone will have their own feelings about words and phrases which make a personal appeal to their own individuality; it might be a nice point whether one would prefer to sit under the professor of "pastoral theology" or his brother of "rural economy"; no one of taste could deliberately prefer the discourses of the professor of "American history" or of "biochemistry." And just as there are words which one is glad to meet and greet with a friendly smile, so there are expressions which almost everyone dislikes as they dislike the sight of some horrid and monstrous deformity. The disposal of human defectives is a difficult and often a repugnant business. What is to be done with verbal defectives such as the plural of virus? The word is come lately into pretty common use and for the good reason that it describes as handily as any other word a group of infective agents about whose place and nature and significance there is a certain amount of doubt. And so it becomes increasingly convenient to mention them in the plural if one is to put technical terminology to its proper use as a shorthand. But who can willingly tolerate "viruses"? The Society for Pure English, of which Dr. Robert Bridges is the moving spirit, prints in a recent tract (XIX., 1925, p. 36) a note by Mr. C. T. Onions (reproduced in the issue of the *Journal of Pathology and Bacteriology*, reviewed on another page), which concludes that there is no alternative. "Neuter pelagus and virus" is a jingle of our youth which remains with us; but the attempt to use "vira" seems ultra-pedantic and, in fact, there is no evidence that this was the classical plural, since the word is recorded only in the singular. It might be argued that the word is in fact taken from

French rather than Latin; Pasteur used it a good deal and it has survived with his successors more continuously and freely than with us. But this would leave us in the undesirable confusion of having singular and plural spelt the same. There seems, indeed, as Mr. Onions says, no escape for the moment, except to drop the word altogether and think of another one. The progress of thought is always in advance of the progress of language, and the Society for Pure English has a field in the medical sciences which is inherently fertile enough, though whether it will respond very fruitfully to cultivation is another question. The meaning and real utility of such first-rate words as "antigen" become obscured and muddled through misuse, and sympathy may almost be felt with the musical comedy spirit which reduces "bacteriophage" to its final syllable.

A PATHFINDER IN MEDICINE.

Mary Putnam Jacobi was one of the first of the band of women who have taken up medicine as a profession and she met with the opposition from her family which most women pioneers did meet with. The story of her life is told in two volumes¹ which have recently appeared. She was the daughter of George Palmer Putnam and Victorine Haven his wife, George Putnam being a member of the well-known publishing firm. His mother was Catherine Palmer, a sister of whom became Mrs. Peabody, and one of Mrs. Peabody's daughters became the wife of Nathaniel Hawthorne. Mary Putnam was born in 1842 in London to which city her father had come to establish a branch of the publishing firm. The project, however, did not eventuate and the family returned to New York. Mary Putnam had made up her mind to enter the medical profession, but found few facilities in New York for acquiring any medical education, although she was able to take a degree in 1863 from the New York College of Pharmacy. Two years previous to this her father had asked her to postpone her medical studies. Between 1861 and 1863 occurred the Civil War in which George Haven Putnam, Mary's brother, served. He broke down in health and his sister was allowed to go to Brashear City, near New Orleans, to nurse him. On this her father, although still disapproving of her going on with her medical studies, did not withhold his consent. "I am willing," he writes in 1863, "that you should apply them (your abilities) even to the repulsive pursuit (for so it is in spite of oneself) of medical science." After a good deal of difficulty she was allowed to enter as a student of the Paris Faculty of Medicine, and in 1868 she attended the École de Médecine, being the first woman student of that venerable institution. This school, which obtained a separate building for itself in 1281, occupied for a period a house at the corner of the Rue de la Bucherie and the Rue de l'Hôtel Colbert, inaugurated by the anatomist Winslow, who taught there. This was in 1745, but by 1775 the building had got so out of repair that the school moved to the Rue de St. Jean de Beauvais, where Mary Putnam studied. She was admitted a Doctor of the Faculty in 1871, and in the meantime was fortunate enough to meet a number of interesting people, amongst others she became very intimate with the Réclus family. She was in Paris during the siege and the Commune. Her letters throughout her whole stay are bright, witty, and informing, and like a true woman she writes a lot about her clothes. After Paris she returned to New York, where she practised more or less continuously until her death in 1906.

The companion volume contains a carefully edited selection of Mary Jacobi's writings. The earliest of these take the form of letters from Paris to the *New*

¹ Life and Letters of Mary Putnam Jacobi. Edited by Ruth Putnam, with a foreword by George Haven Putnam. Mary Putnam Jacobi: A Pathfinder in Medicine. With Selections from her Writings and a complete Bibliography. Edited by The Women's Medical Association of New York City. New York and London: G. P. Putnam's Sons. 1925. Pp. 381-521. 15s. each.

York Medical Record, beginning in 1867, when the writer was 25 years of age, and continuing to 1871, the year of her graduation. For so young a writer they show much accurate observation. One of the most interesting is a précis of a paper read by Mr. Rodet before the Imperial Society of Medicine at Lyons in July, 1867, upon the question of the contagiousness or otherwise of cholera. The meeting apparently came to no conclusion on the matter, but on the question of treatment Dr. Jacobi quotes from Rodet a prescription used by Mr. Lisle, physician at the Marseilles Insane Asylum, which was seriously affected by the epidemic of 1865. It consisted in the administration of copper sulphate. Dr. Jacobi gives the formula, but has unfortunately forgotten to give the dose. Before trying this remedy Rodet lost 12 patients out of 14, but after he began to use it he had 25 recoveries out of 32 cases. The use of copper sulphate has apparently dropped out, but the salt is well known to have a marked power of inhibiting the growth of low vegetable organisms, and a mere trace of it will keep a tank of rainwater free from algae. Other papers are addresses mainly dealing with women in medicine, such as that reprinted from the *North American Review* for January, 1882. The final paper is pathetic, for it is the account written by herself of the early symptoms of the meningeal tumour compressing the cerebellum, from the effects of which she died. The record begins in 1896 and is continued down to 1903, three years before her death. Sydenham died from an acute attack of gout, a disease from which he had suffered all his life, and his treatise upon which is his chief work; but we have no parallel to a trained medical woman deliberately sitting down to chronicle the progress within herself of a disease which she must have suspected from the first would prove fatal.

OLIGURIA FOLLOWING BLOOD TRANSFUSION.

SETTING aside the avoidable danger of incompatibility, to which Dr. E. L. Hunt called attention last week in our correspondence columns, blood transfusion is only rarely responsible for results which endanger life. F. W. Barcroft¹ has recorded a case of oliguria following transfusion. A woman, aged 49, was rendered anæmic by metrorrhagia due to an incomplete abortion. Prior to curetting she was transfused 400 c.cm. by the Unger method. Tests had shown that there was no agglutination or hæmolysis of the cells of either donor or recipient. The transfusion was followed by a rigor. During the nine days following operation only 35 oz. of urine were secreted. The daily amount varied from 1 to 6 oz. The urine was clear, specific gravity 1010, and contained a trace of albumin. All attempts to increase secretion having failed and the patient's condition being desperate, both kidneys were decapsulated under gas and oxygen, the operation lasting 20 minutes. On the tenth day 9½ oz. were secreted and increased daily, reaching 51 oz. on the fourteenth day. Recovery ensued, but was complicated by a suppurative right parotitis and by a right lumbar intraperitoneal abscess, due to opening and infection of the peritoneum during the hurried decapsulation. Eight cases of extreme oliguria, or anuria, following transfusion are mentioned by Barcroft. Six cases died. Hæmaturia or hæmoglobinuria occurred in several of the cases. In most of the cases preliminary tests had shown compatibility of the bloods of the donor and of the recipient, but in some of the cases tests, performed after occurrence of oliguria, showed incompatibility, there having been errors of technique in the preliminary tests. In one case of pernicious anæmia two transfusions were made from one donor without complications. A week after the second transfusion a third transfusion was performed, this time from another donor. This was followed by anuria for 48 hours. The patient recovered from the

anuria, but died of the pernicious anæmia. The bloods of both donors were compatible with the patient's blood, but when the bloods of the two donors were tested against each other hæmolysis occurred. Decapsulation in nephritis, performed by Harrison in 1896 and by Edebohls in 1901, has not been generally adopted. Bessensen, in November, 1924, stated that after decapsulation 65 per cent. improve, 20 to 25 per cent. remain in statu quo, and 5 to 10 per cent. die. He considers that, in nephritis, decapsulation is only of temporary benefit and is a procedure of necessity rather than of choice.

THREE HOSPITAL PHARMACOPŒIAS.

WE have heard it said that the "push-bike" is the piece of machinery approaching nearest to perfection which has yet been invented by man; for whereas formerly there were many varieties, now one type is dominant, and this type has remained constant for many years. On the same principle hospital pharmacopœias must also be approaching perfection, for in outward form they are very similar. Internally they do vary somewhat, but not to any striking extent. In the three examples before us there are, however, a few slips. We note *Sippy* for *Sippy*, *carbonis* for *carbonatis*, and the students' old error of taking *folia* as singular and declining it *foliæ*, *foliarum*. The London Hospital book opens with some minatory rules, which include the words: "Residents, in their prescribing are confined entirely . . ." on which immediately follows an excellent antidote table. The pharmacopœia itself includes the preparations of the B.P., an arrangement which increases its bulk and its usefulness. A handy summary of the Dangerous Drugs Act is placed at the end of the book, where it is easy to find. The West London Hospital separates its hospital preparations from those of the B.P., giving the latter as a list of doses. The London Temperance Hospital does the same, without giving all those of the larger work. Both of these hospitals go further afield with directions of a general nature. The West London tells how to bring up babies, how to arrange the sanitary condition of the home, and how to give Lenhartz, Sippy, and Graham diets. The Temperance Hospital describes preparation for operation, gives directions for cases of ringworm, and for the management of rickety children. As becomes a Temperance Hospital, there is a note that house surgeons and house physicians must not prescribe brandy and other beverage alcohol on their own responsibility. All three pharmacopœias are as nearly perfect as can be.

SCIENCE AND MISSIONARY WORK.

IN the current issue of the *Journal of the Cambridge University Medical Society* there is an interesting paper by Dr. J. Howard Cook, in which many instances are given of how science has aided the work of missions. Missionary work was from the start a prominent part of the Church's task, and although it did not extend beyond the limits of the Roman Empire during the first five centuries or so of the Christian era, those limits were roughly the limits of the known world, within which disease of all types was rampant. But as early as the sixth century the Nestorian Church pushed as far as Malabar, and by the eighth century China was reached. In the thirteenth century the Orthodox Church of the East had arrived in Persia and the Armenian Church in India, while a little later the Dominicans and Franciscans were at work in Northern Africa. The Jesuit missions of the sixteenth century and after are too well known to need more than mention, and from the seventeenth and eighteenth centuries and onward our own country exhibited active missionary effort. Therefore, for more than 1000 years missionaries have laboured subject to the plagues and pestilences of their centres of work. The records of deaths from disease amongst missionaries are scanty, but there can be no doubt

¹ F. W. Barcroft: *Annals of Surgery*, April, 1925, p. 733.

that disease took a large toll of life from these brave messengers, whose aims in recent days have been furthered by the advance of medicine. Most people welcome a religion if they can obtain some material good from it, and there can be no doubt that the benefits obtained from the cure or prevention of such diseases as malaria, plague, and sleeping sickness have proved, at any rate in primitive eyes, practical testimonials to the value of Christianity. Science has shown the way by which mission hospitals may bring healing to stricken multitudes, and Dr. Cook quotes some striking examples here. In the period 1901-1904 sleeping sickness was responsible for 200,000 deaths in Uganda, the mortality being practically cent. per cent. Missionary work was at first hindered, for the natives said, "Christianity has brought us the sickness." But preventive methods on the lines advocated by Castellani and Bruce were instituted, and the following figures for the kingdom of Buganda show the results: Deaths for 1905, 8003; for 1910, 1527; for 1915, 3; for 1917 and subsequently, none. Such results obtained by Christian teachers naturally disposed the native to a patient hearing. The power that may be obtained by an ethical leader who can cure or prevent disease is dramatic, and modern science is aiding the coming of the time when "all shall be one" in no uncertain manner, not only by disposing the hearts of people to receive Christianity, but also by rendering the lives of devoted workers far more secure than of yore.

"COLDS."

SCIENTIFIC interest in a disease is apt to vary directly with its rarity, so that minor maladies, and in particular the common cold, do not receive that attention in text-books of medicine which their prevalence would appear to warrant. Of recent years the common cold, however, has been studied more assiduously and in particular from the standpoint of prevention. Dr. Leonard Hill and Dr. Argyll Campbell devote a chapter in their new book on "Health and Environment"¹ to the cause and prevention of "colds." They summarise the supposed causes of "colds" under five headings: chills and draughts, certain conditions of the weather, irritation of the respiratory mucous membrane, infection, and bad ventilation. Each of these supposed causes is then discussed in turn. Exposure by itself will not cause "colds" in healthy individuals, as is shown by the immunity to these disorders enjoyed by Arctic explorers and fishermen at sea. If, however, a person is already infected there appears to be some slight derangement of the heat-regulating mechanism, so that he feels a draught of cold air more easily than a normal healthy person and attributes a "cold" already "on him" to this cause. Cold, dry weather and strong drying winds do not favour epidemics of "colds," while unfavourable weather conditions, such as a high relative humidity of the atmosphere with a variable temperature, certainly do. Irritation of the respiratory mucous membrane by dusts and chemical irritants is also a cause of "colds," while a certain section of the community appears to suffer from a nervous derangement of the nasal mucous membrane, so that sudden changes of temperature and atmosphere may produce an acute paroxysm of rhinorrhœa. While "infection is not the whole story," there is no doubt about the importance of this as a cause of the common cold, and such factors as closeness of contact, duration of contact, and general conditions of ventilation vary for this as for other bacterial infections. In the opinion of these two authors, however, bad ventilation is the commonest cause of "colds." Warm, stagnant air produces a congested, swollen appearance in the nasal mucous membrane, which becomes covered with thick secretion and affords a weak spot for bacterial attack. In cool air, on the other hand, the membrane is pale and taut and well moistened with secretion. Added

to the hot air so often present in the upper layers of a badly-ventilated room is the occurrence of cold air near the feet. Thus "cool breezes blowing round the head, the radiant heat of the sun, and a warm ground to stand on are the ideal outdoor conditions." The reverse of this which produces cold feet and stuffy heads is said by these authors to be present in the House of Commons! If these elementary facts about ventilation were appreciated a great many "colds" would be prevented. Dr. Russell L. Cecil, in a little popular book on this subject,² emphasises this, pointing out that the "non-contagious cold" largely depends upon the condition in which we keep our nasal mucous membranes. Besides dealing with the more common methods of treating "colds," Dr. Cecil describes the chlorine treatment, in which chlorine gas in a concentration of 0.015 mg. per litre of atmospheric air is inhaled by patients either in a special chamber or from an apparatus which delivers this concentration through a paper face-piece. This method, based upon the fact that no cases of influenza occurred amongst the workers in a chlorine plant during the epidemic of 1918, seems to have a certain amount of vogue in America, and Dr. Cecil speaks well of the results. The relationship between influenza and the common cold as suggested by this therapeutic measure is an aspect of "colds" which is especially dealt with in a review of the literature on influenza and the common cold by J. G. Townsend, published by the United States Public Health Service.³ It is claimed that the association between influenza and minor respiratory disturbances, especially that known as the "common cold," is "more intimate than has been recognised or conceded." The Public Health Service arranged in 1923 to receive fortnightly reports from 10,000 persons in the United States as to whether they had suffered from any of these minor respiratory disorders during the period in question. The final analysis of the material thus collected may help to elucidate the problem.

PORTRAIT OF SIR JOHN MACALISTER.

THE Council of the Royal Society of Medicine has opened a fund to commemorate the 38 years of service of Sir John MacAlister as secretary of the Society. The memorial is to take the form of a portrait or bust to be placed in the Society's house. A letter has been sent to all the fellows and members of the Society. The Council believes that others outside the Society who appreciate the great work done by Sir John MacAlister in amalgamating 18 medical societies into one corporate body will desire to contribute to the portrait fund. Subscriptions should be forwarded to the hon. treasurers, Royal Society of Medicine, at 1, Wimpole-street, London, W. 1. These will be acknowledged in detail in our columns. The first well-supported list accounts for £615.

RETIREMENT OF SIR WILLIAM HAMER.

THE large number of medical men, hygienists, and officials who have come into relations with Sir William Hamer, Medical Officer of Health to the London County Council, will learn with sincere regret of his impending retirement. It is 33 years since he became Assistant Medical Officer to the Council under the late Sir Shirley Murphy, succeeding his chief as Principal Medical Officer in 1912. During that long period he has used devotedly his talents as epidemiologist, statistician, and organiser in the public service. He will carry with him into private life the good wishes of all who know the thoroughness and efficiency of his work, and who have experienced the courtesy of his methods.

¹ Colds: Cause, Treatment, and Prevention. By Russell L. Cecil, M.D. London and New York: Appleton and Company, 1925. Pp. 111. 4s. 6d.

² Supplement No. 48 to Public Health Reports, 1924.

³ London: Arnold and Co. 1925. Pp. 208. 12s. 6d.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXIII.

THE TREATMENT OF IRREGULAR TEETH IN ADOLESCENCE.

OUR knowledge of the causes which produce malrelationship of the teeth and jaws is still very imperfect, but that knowledge is slowly increasing, and to the majority of workers in the field of orthodontics it is becoming evident that maldevelopment and lack of coördination of the factors governing growth account for by far the greatest number of malocclusions. The further back these causes are traced the surer becomes the conviction that treatment should be commenced far earlier than at one time was considered necessary.

Preventive Orthodontics.

Many cases are on record whereby successful treatment of the deciduous teeth at 3-6 years of age has rendered further movement of the permanent teeth unnecessary. No cases, so far as I know, have been described where a definite effort has been made so to influence antenatal development that the resulting child has been successfully reared with normal occlusion. Indeed, it would be difficult to prove to the scoffers that careful supervision of antenatal conditions helped to produce a normality which might occur in any case. The fact, however, that malocclusions have occurred even under a most favourable environment would tend to show that mixture of races and inherited tendencies must not be forgotten when considering this problem. Attention should be drawn to the work of Harold Chapman, who, in making an effort to trace the causes of malocclusion, has been studying the teeth and jaws of members of the same families reared under similar or different environment, and other workers are being enlisted to enlarge the scope of this investigation.

One of the causes which leads to a grave complication which intelligent foresight could so easily eliminate is the loss of space in the temporary dentition caused by the reckless extraction of deciduous teeth, and it is surprising that so many operators have so little regard for this important point. It is not to be denied that septic temporary teeth are a specific source of danger to the whole organism and can rarely be treated satisfactorily, but it is reckless prematurely to remove deciduous teeth without restoring lost function and retaining the interproximal space. The dental surgeon who impresses on parents and teachers the value of a healthy deciduous dentition, and carefully conserves those that come under his immediate care, may thus be regarded as a practitioner of preventive orthodontics.

Diet.—The careful preservation of the temporary teeth through the agency of well-thought-out diets, attention to general health, and oral hygiene is the ideal to be aimed at, supplemented, if necessary, by simple conservative treatment. For infants breast feeding should be urged, the child's mouth being cleansed after each feed with a soft piece of muslin, wrapped round the little finger and dipped in normal saline solution. The desirable diets for young children have been thoroughly worked out by Sim Wallace and Harry Campbell among others; the reader is referred to their works for more elaborate details and arguments which are beyond the scope of this article. Suffice it to say that the chewing of hard foodstuffs should be arranged and wholemeal bread, crusts, and toast used freely. Most children enjoy biting hard things, and can easily be trained to do so. It will be found that they refuse to swallow lumps of food unless unduly hurried by an impatient nurse. Every meal should end with some form of sweet acid fruit, a little

orange-juice, grated apple, or squeezed grapes when the child is very young; as a child gets older the quantity and method of preparation can be varied.

Oral Hygiene.—Sweetmeat eating is a habit forced on children by indulgent parents and relations, and becomes a most pernicious one; some of the most dreadful ravages from caries have been seen to result from giving a child a chocolate "to go to sleep with." The mouth and teeth should always be cleansed most carefully after the last meal at night, which must always be finished with fruit, and nothing at all given after. In the very young probably the cleansing is done most efficiently by training a child to rinse and gargle vigorously with plain cold water or normal saline; antiseptic washes and tooth-pastes should be avoided. Teach a child to use the buccinators from the earliest age, and the tooth-brush, which really needs very skilful use to be efficient, can be eliminated. When used, tooth-brushes should be the smallest made. Most manufacturers make tooth-brushes far too large, and adults would do well to use what are called children's brushes.

When brought up on these methods it will be found that until children go to preparatory schools, where such simple means of preventing dental caries are not appreciated, the deciduous teeth survive their full term of usefulness without a spot of decay, and the jaws are developed within the limits of their inherited possibility. It must not be forgotten that the first permanent molars appear at the age of 6 and ultimately become the oldest inhabitants of the mouth, with the greatest chance of becoming carious. According to the readings of Friel's dynamometer these are the teeth round which centres the greatest masticating stress. The utmost care should therefore be employed in the constant inspection and conservation of these teeth.

Treatment of Established Irregularity.

We are often called upon to give advice in cases where, through ignorance or possibly unfortunate environment, the patient has suffered a loss of growth that can never be restored and the apical base of Franke and Lundström is permanently reduced in size. It is then very doubtful if tooth movement alone will relieve permanently the overcrowded denture. The treatment of children of 13-14 years of age suffering from malocclusion, who have been deprived up to that time of any but the most primitive kind of dental service, is a difficult problem. Dolamore has shown that the most desirable ages for some forms of treatment, for example, when endeavouring to cure excessive overbite by means of a biting plate, are those which correspond to the most active periods of bone growth, that is to say, during the eruption of the first or second permanent molars, and should the latter teeth be late in erupting it may be quite feasible to undertake a line of treatment that would be doomed to failure in a child of more advanced development. It must be recognised that the physiological age of an individual does not necessarily correspond with the actual age. The dental surgeon in England is hampered by the boarding-school system of education, for children are mostly seen infrequently, if at all, during the school term, and dental apparatus of any kind must be so strongly constructed as to withstand a good deal of hard wear without supervision or repair. In this respect girls, who are still sometimes educated at home, have the advantage, and this is fortunate in that parents of girls are, as a rule, more concerned about disfigurement.

Another important practical problem that has to be faced is the length of time that may be involved in a course of treatment. Most authorities agree, although this idea has been a matter of controversy recently, that tooth movement should be slow enough and gentle enough to produce bone growth concurrently with that movement, thereby shortening the period of retention. The prognosis in adolescent cases is always obscure, because it is difficult to study the action and reaction of the different groups of muscles of the masticating face, and to ensure an harmonious

coördination between them. If muscle exercisers such as Rogers recommends are used, it is only in exceptional cases that such treatment can be carried out without close supervision. If, for instance, a child is even a partial mouth-breather the group of muscles concerned in closing the mouth is necessarily kept below par for that individual, but muscle exercisers require regular and constant use and make almost impossible demands on an unwatched or unencouraged child. Much may be done in treating the disability of mouth-breathing by the insertion of an "anti-mouthbreathing valve," to be worn at night with the object of re-establishing the habit of nasal breathing after nasal stenosis has been eliminated. Rhinologists often overlook the fact that mouth-breathing persists as a habit even after the nasal airway has been rendered fully patent.

All cases will not, of course, yield to the same treatment. Cases of post-normal occlusion of the mandible with proclination of the incisors are reported successfully treated at the age of 15, and after, without extraction. But, on the other hand, many are known to have reverted that have been treated at a still earlier age. This type of case is often accompanied by a marked "over-bite," the mandibular incisors impinging on the gum behind the cingula of the maxillary incisors. After the second molars have fully erupted it would seem of slight avail to make any attempt to "raise the bite." If the canines are late in erupting and occupy a high position external to the arch the sacrifice of the first upper premolars will often produce a satisfactory result without any supplemental treatment. If at the age 13 to 14 lower incisors are markedly imbricated, showing a developmental lack of bone growth uncomplicated by post- or pre-normal occlusion, the removal of the most lingually placed incisor will often improve the appearance when the attempted retention of all the teeth would involve expansion of both jaws, a long process, and at this age of doubtful utility. Similarly, if second premolars have been allowed to erupt inside or outside the arch, it is doubtful if it is advisable to attempt to regain the lost space and place such teeth in their correct positions in the arch. But there are many cases where the occlusion, which always has to be most carefully studied, will not permit the success of this simple treatment, and misplaced teeth, even after the extraction of others, must be guided into the desired positions with extra mechanical help. Great care should be exercised to make this aid efficient—the mere "wearing of a plate" will not work miracles; any apparatus worn must be designed with intelligence and adjusted with skill. At this age cases of post-normal occlusion of the mandible with proclination of the incisors are probably treated best in this way. Prenormal occlusion of the mandible is usually accompanied by lack of development of the premaxilla, and any treatment undertaken must be accomplished with the additional aid of mechanical appliances.

Although there are many cases of all types that have been treated successfully without extraction at the age-period under discussion, intelligent use of the forceps with or without supplemental treatment would seem to offer the surest means of obtaining a reasonably aesthetic result with far less fear of relapse than any other method.

G. NORTHCROFT, O.B.E., L.D.S., D.D.S.

WOMEN'S HOLIDAY FUND.—For thirty years the Women's Holiday Fund has been engaged in the work of sending away tired women living in the poorer districts of London for a fortnight's holiday at the seaside or in the country. Each applicant contributes something towards her expenses, the average payment made being one-third of the total cost, which is about £2 17s. 6d. for a woman, and £3 7s. 6d. for mother and baby, for two weeks. The committee are making an emergency appeal this year for the sum of £4000-£5000 to purchase a holiday home for mothers and babies, the lease of the one they rented at St. Leonards for this purpose having terminated in 1924. Donations will be gratefully acknowledged by Miss G. Cooper, Secretary, Women's Holiday Fund, 76, Denison House, Vauxhall Bridge-road, S.W. 1.

Special Articles.

SOME GENERAL REFLECTIONS ON PUBLIC HEALTH ADMINISTRATION.

BY J. H. L. CUMPSTON, M.D. MELB., D.P.H. LOND.,
DIRECTOR-GENERAL OF HEALTH, COMMONWEALTH OF AUSTRALIA.

III.—THE PRIVATE HEALTH AGENCIES.*

IN view of the trend of evolution in the United States, and, to a certain extent, in other countries and in the international field, it is interesting to examine the significance of some important developments leading towards the displacement of the legally constituted governmental authority from its proper place in control of existing public health activities and at the head of public health progress. Various private agencies have entered into the field of public health and have assumed, especially in the United States, an importance which is, for those who have not seen the conditions, difficult to realise.

There are four classes of unofficial agencies all having an influence on the evolution of public health in the United States more weighty than that of the official Government departments.

(a) The great foundations which have been endowed by wealthy people with large funds for the purpose of promoting the welfare of the community in some way or another, such as the Rockefeller Foundation, Commonwealth Foundation, and others similar.

(b) The various associations and societies which have been formed, such as the National Tuberculosis Association. These are membership societies composed of individuals, interested in some form or another of public health activity who have formed themselves into societies for the promotion of their particular interest.

(c) The American Public Health Association, which has a large membership mostly of persons engaged in some form of public health activity as their professional career.

(d) Agencies which have become interested in public health because of a direct business interest in the success of such work. The most notable of these is the Metropolitan Life Assurance Society, which now spends a very large amount of money annually in public health activities of a very specific and direct nature, on the ground that any improvement in the general standard of public health is financially to the advantage of the company in its life assurance activities.

Range of Private Enterprise.

These agencies are engaged in a wide variety of enterprises, ranging from what are known as demonstration campaigns, through actual field operations, to definite standardisation activities. As examples of these—

(a) The Metropolitan Life Assurance Company was engaged for seven years in a "health and tuberculosis demonstration" campaign at Framingham, the object of which was to demonstrate the principal factors in the spread of tuberculosis and the principal methods for its control, as well as making a general health survey.

(b) The National Tuberculosis Association operates, through its branches, a number of tuberculosis dispensaries, employs many tuberculosis nurses, and carries on similar activities directed towards the control of tuberculosis.

(c) The National Association for Child Hygiene has taken the lead (together with the Metropolitan Life Assurance Co.) in promoting the compilation of a survey of the health status of 83 of the principal cities in the United States.

(d) The American Public Health Association has actually compiled standards for the laboratory examination of milk, water, and sewage which have now been accepted by all official health departments.

The International Health Board stands in a class by itself because of the large amount of its endowment resources and because of its international scope. Notwithstanding its international application it is very closely associated with many activities within the United States—e.g., it subsidises many of the

* Parts I. and II. appeared in THE LANCET of July 11th and 25th respectively, and the concluding part will appear in a subsequent issue.

private membership associations, it provides funds for the building of schools of public health in universities, and it provides funds and staff for the inauguration of county health units, operating under the jurisdiction of State health departments. In one State at least an officer of the International Health Board staff is acting as an officer of the State Health Department, being loaned and financed by the International Health Board. It would appear to an outsider that these private agencies in the United States are more active than the official governmental agencies, although perhaps this appearance is due to the receipt by the private agencies of greater publicity. Their exact position in the scheme of public health activities challenges the inquiry of any visitor who goes to study the public health system of the United States.

Its Course of Development.

Notwithstanding considerable inquiry it is not easy to gain a clear or comprehensive conception of the conditions which called these agencies into being or an intelligent appreciation of their exact course of development. It would appear, however, that while in some States there has been for many years a strong realisation of the duty of the State Government to establish and maintain a modern health department in accord with the developments in scientific knowledge, in other States there has been a less complete realisation of the responsibilities of the State Government and a corresponding lag in the development of public health activities. In these latter States interested citizens have taken the lead in one or other directions, such, for example, as child welfare, tuberculosis, &c., and by the formation of societies, the enlistment of public interest, and so on, they have supplied the community with the institutions and equipment necessary for the public health, which the governments had failed to provide. This, however, is not the whole story, as these societies have come into being and have become active in States where the necessity for public health activities has been acknowledged by the Governments in practical form. For example, in Massachusetts the public health reform movement in the United States commenced with a vigorous crusade, arising out of the Massachusetts Sanitary Commission in 1850, which led to the introduction of many valuable public health activities and set a standard which has influenced public health development throughout the United States until now. Despite this, there is seen to-day in the city of Boston the interesting development that the city government provides a building, with caretaker and light services, for the housing of certain private societies to which it has, in fact, delegated its responsibility in respect of certain public health functions.

So, throughout the United States, there are seen: tuberculosis being dealt with by the tuberculosis associations; child welfare (including the management of baby clinics) by the child hygiene associations; the actual administration of health responsibilities of the State being delegated by statute to the Alabama State Medical Association; and certain county health departments being staffed by, and partly financed by, the International Health Board. The International Health Board invariably makes it a condition of its coöperation that the State or local community, as the case may be, shall contribute half the cost and agree to, or request, the coöperation.

Criticism of the Private Agencies.

The impression is that there are certain advantages and certain disadvantages attending this complex series of activities, and it would be desirable, in view of developments elsewhere, to consider these.

The advantages, as they were stated, may be summarised as follows:—

1. Private benefactions have provided larger amounts of money for public health than would probably have been available from public taxation.

2. Private agencies feel that they are freer to try experiments, and possibly make failures, than would be a government department.

3. Private agencies can use more unrestrained methods of publicity and public education than can a governmental department.

4. Private agencies reach the ear and sympathy of the public more completely than a government department.

5. By the provision of financial assistance active governmental agencies are enabled to undertake operations which they could not otherwise finance.

The apparent disadvantages may be summarised as follows:—

1. Several agencies in one community are apt to find themselves bidding against each other for (a) subscriptions, if in need of funds; (b) opportunities to work without competition, if well endowed.

2. If events do not move in the direction the particular agency desires, it is almost inevitable that the agency finds itself (or its officers) committed openly or engaging less obviously in intrigue to induce the Government or the officers of Government to adopt the policy which the agency concerned is advocating.

3. The officers employed by these private agencies or foundations are often persons trained only in a limited field, without any proper training in public health as a whole, and without any experience of public health administration. Public health requires, as an essential for efficiency in its servants, a reasonable appreciation of the whole field of influences which may affect the human individual, and this wide view is not attainable by the system of limited training necessarily adopted by these agencies whose activities are limited by the self-imposed limitations of their field.

4. The abundance of financial resources is in itself an embarrassment. These associations are almost compelled to find means for expending their income, and it has frequently happened that they have inaugurated institutions and campaigns at a rate of expenditure per head of the population concerned which is beyond the normal expenditure-out-of-taxation-revenue capacity of that population. When this has happened either the venture has quietly lapsed or the association or foundation concerned has been obliged to continue the venture out of its own resources.

5. Those associations which are not financially independent find themselves obliged to frame their policies along lines which will assure them of further public financial support, and it may be regarded as problematical whether this does, not offset the advantage, claimed above, of freedom to try experiments not influenced by political control.

6. It has happened that the associations or foundations have started activities in some communities, either with or without coöperation from the local government, but have found, when they wished to discontinue or to hand over administration to the local people, that the local community was not prepared to assume control; and the initial enthusiasm (sometimes artificial) having evaporated, a permanent result proportionate to the expenditure of energy and money has not been attained.

7. Finally, there is the fundamental objection which is always inseparable from all "easy money." No community can obtain lasting profit from anything which it does not earn by its own efforts. With a community, as with a person, the acceptance of a gift of this kind induces one of two attitudes—either that of the "borrower being servant to the lender," or the care-free laxity of the dependent who finds his needs supplied without any effort of his own. Either attitude is prejudicial to the vigorous growth of any community.

Trend of Events in the U.S.A. and New Zealand.

There are sufficient signs of the trend of events in the United States which should act as sign-posts for the road to be travelled in other countries. The necessity for correlating the activities of the various societies, associations, and foundations has led to the formation of a National Health Council, which represents a kind of group-management of policies without any organic unity. The associations represented on this Council are ten in number. These have now grouped their head offices in the one building, and it is significant that the New York branch office of the United States Public Health Service has its office in the same building and on the same floor as the National Health Council. This Council, or its components, has now associated with itself several persons with actual experience in public health administration as a whole field, in order to provide some approach to a bridge over the gap between these unofficial agencies and the official health machinery. But it is interesting to note that these unofficial bodies are now actively concerning themselves with the establishment of standards for a satisfactory health department for cities of a certain size, and with the

formation and promulgation (towards the ultimate object of enforcement) of a mathematical basis of assessment by which the activities of the public health department of any city may be arbitrarily adjudged. In other words, the private membership associations and private foundations feel themselves competent and entitled to compile and promulgate standards by which the work of city health departments shall be adjudged. Inasmuch as this will probably apply in practice only to those cities in receipt, officially or otherwise, of financial assistance from these agencies, there can probably be little objection to those agencies framing standards by which to judge the extent of response to their generosity. But the situation is, in essence, unhealthy. In an educated and self-governing community the measures provided for the people must be such measures as are prompted by the conscious will of the people—i.e., by the Government—or they cannot be permanently successful.

On the other hand, in New Zealand the overwhelming success of the movement for the care of infants has been entirely due to the work of a voluntary society. It was by aligning the women of New Zealand behind his crusade for the protection of infants, and by this means alone, that Sir Truby King was able to secure such striking results. But it has now been found advisable to make a governmental activity of this movement, at least in part, and Dr. King has been joined to the Health Department as an officer of that Department—the whole work being under Health Department jurisdiction.

Government Control or Supervision.

There appears to be a growing opinion amongst these private agencies in the United States that all the work they are doing should properly be part of the work of Government, whichever form or function of government was best adapted to control any particular part of the work, and that the function, if any, of private agencies was to assist governments, not to act as their substitutes. It is impossible to conceive any course of action, other than autocratic governmental prohibition, which would prevent the spontaneous formation of such associations or societies, or prevent some philanthropically-disposed wealthy person bequeathing his money for some purpose of the kind now under discussion.

The State of Alabama has in its legal code an unusual provision:—

"No board, body, or organisation shall engage in any public health work except under the supervision and control of the State Board of Health."

This method does not entirely prevent trouble. The simplest way to avoid complications arising from this source, a way which would at the same time be most calculated to bring lasting good to the community, would be for Governments, or, rather, the people whom Governments represent, themselves to perform those simple duties in the field of public health which apparently are being left more and more largely to private agencies. Private agencies cannot operate effectively in respect of environmental sanitation which is exclusively a matter for Government. Private agencies find their most profitable and most dramatic field for work in the various phases of individual hygiene, but individual hygiene in almost all its aspects depends for success upon efficient environmental sanitation. The mother, in her relation to public health—i.e., at the time of child-bearing—is influenced by her environment in respect of food, occupation, and infection. The infant at the time when it is the concern of the State—i.e., during the first year of life—is liable to environmental influence in respect of food and infections. The infantile diarrhoeas are to a large extent referable to the same environmental factors of sanitation as are the typhoid and cholera group, and are controllable by the same measures as have been used successfully in those diseases. In tuberculosis it is now accepted that environment—i.e., housing, occupation, food (or economic status, which determines all three)—plays a part at least equal in importance to infections.

Control of the environment cannot be secured by any haphazard efforts or transient stimulations of public interest by official or unofficial agencies, but must be solidly based upon a legal code deliberately framed by experienced sanitarians and backed by a solid public opinion demanding the enforcement of at least the major provisions.

Public Health Not Purchasable.

One of the most misleading public health epigrams is that officially used by the New York City Health Department—"Public health is purchasable"—as if public health were a tangible commodity. The implication is that with sufficient money the irreducible minimum of mortality- and morbidity-rates can be secured. All experience shows that this is not true. Public health is merely the expression of private individual health which in turn is regulated by the standard of education (upon these matters of health) attained by the individual and the degree to which the knowledge possessed is used. Money will not make a people wise. One can, without surrendering any convictions, welcome gladly the enormous assistance being rendered by these private agencies to the advancement of public health. The International Health Board is, beyond all question, the greatest single force in public health to-day. But, in the end, public health, to be successful, must be the practical expression of the conscious will of the people themselves—which is Government.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Recrudescence of Alcoholism.

DURING the last few years an increase in alcoholism has been noticed in France, which compares unfavourably with the marked diminution of the war period. A commission appointed by the Academy of Medicine has recently been inquiring into this. In his hospital experience during the course of six months, Dr. Achard has found obvious alcoholic stigmata in 44 men out of 418 entrants, and in 38 women out of 579 entrants (roughly 10.5 per cent. of men and 6.3 per cent. of women). This represents only the minimum, for many drinkers did not as yet show any stigmata. Apart from those diseases which had been aggravated by drinking, there were 21 cases—of cirrhosis, delirium tremens, polyneuritis, and gastritis—in which the illness could have been avoided by temperance. Cirrhosis was more frequent amongst women; in 100 alcoholics the proportion of cirrhotics was 18 per cent. for women and 9 per cent. for men. This increase in alcoholism is a reflection of the increase of alcohol consumption in France, which fell from 1,413,000 hectolitres in 1914 to 584,000 in 1918, but has risen again to 1,016,000 hectolitres in 1923 and 968,000 in 1924. The probable causes seem to be: The relative increase of wages amongst manual workers compared with other citizens; the eight-hour day with its increase in leisure; and the reappearance of absinthe in disguised forms. Complete prohibition hardly seems applicable to France, but it would be proper not to give official recognition to fermented drinks as "hygienic," and not to encourage the already excessive production of wine. The use of fresh grape juice, and the employment of alcohol industrially, ought to be developed. The oft-demanded suppression of the privileges of those who distil their own fruit seems an impossibility under the French political system. Some restriction of the number of licences might perhaps be considered, but the electoral power of the wine merchants gives them Parliamentary favour. Private campaigns against alcoholism have only a limited sphere of action. Propaganda should begin in the schools; it cannot be given to adults by their employers because of the distrust which would be excited. The workers' organisations would have more chance of success, and it is their leaders that have to be won over; but perhaps it is the doctor who

is most qualified for the task in his rôle of disinterested adviser. It has been suggested that a special commission should be formed under the Commissariat de Santé to undertake a campaign against alcoholism.

Encephalitis and Vaccination against Small-pox.

M. van Bonwyk Bastiaanse, of The Hague, in collaboration with MM. Bijl and Levaditi, have given an account of their observations on the aetiology of encephalitis in children following vaccination against small-pox. They were concerned with cases which, 10 or 12 days after vaccination, showed signs of encephalitis, characterised by sleepiness, fever, signs of irritation of the pyramidal tract and sometimes paresis, without spinal lymphocytosis. These accidents were noticed during an epidemic of encephalitis. Experiment and pathological research have shown that this form of the disease is not due to the virus of Jenner's vaccine. The various stocks of vaccine used were from a supply obtained from the calf which showed no exceptional neurotropic affinities. There is every reason to suppose that in these cases there was a latent infection by the virus of encephalitis lethargica, and that vaccination merely hatched it out. This agrees with the experience of Levaditi and Nicolau, who have shown that a neurotropic virus can bring out a latent infection due to a different but equally neurotropic virus (e.g., hydrophobia and vaccination). The fact that in the cases under observation the encephalitis developed in a site already affected by the vaccine virus explains the special histo-pathological changes seen.

Insulin in Non-Diabetics.

The trophic action of intramuscular injections of insulin in diabetes is well known. At the time of surgical intervention this substance is capable of hindering the development of toxic accidents; it facilitates the cicatrisation of the operation wound, and diminishes the time required for healing. H. Chabanier has reported a similar trophic action of insulin in the case of atonic wounds in diabetics—e.g., in perforating plantar ulcers and varicose ulcers. This action may also be observed in non-diabetic subjects. In small doses, given by injection, insulin leads to rapid cicatrisation of varicose ulcers in subjects with normal blood-sugar content; but he has employed it by injection and by local application in the form of dressings with an ointment of insulin. In every case the remedy has been well tolerated and a notable improvement observed in the patient's general condition in addition to the local change (modification of the skin in the periphery of the ulcer, which regains its normal supply and rosy aspect). In some cases cicatrisation was rapid. Alone or in combination with general treatment such local applications of insulin are able to render great service to the surgeon.

French Views on Rickets.

In spite of the large amount of work carried out within recent years on the aetiology of rickets, some physicians in France still hold views which they refuse to modify in the light of recent knowledge. Putting aside the opinions of Prof. Marfan, who still maintains the paramount importance of congenital syphilis as a causal factor in the production of rickets, even moderate French opinion by no means accepts, for example, the vitamin theory, although cod-liver oil was first used in France for the cure of this disease. At a recent discussion before the Société Médicale des Hôpitaux de Paris Dr. G. Variot sounded a note of warning on the subject of "sun-deficiency" as an aetiological factor, pointing out that because ultra-violet light had such a striking effect in curing rickets, it by no means followed that deficiency of this light was an important cause of the disease. He then elaborated the theory of "dysalimentation," which stresses incorrect diet at the period of weaning. This remained, in his opinion, the most important factor. He particularly indicted the removal of all milk from the dietary at this period and the substitution of starchy foods made with water. Prof. Comby, who

also took part in the discussion, agreed with this view, and, while not denying the importance of hygienic factors such as the sun, air, light, and exercise, stated that these factors did not play any vital part in the majority of cases. He pointed out that in this his opinion had not changed materially since he first affirmed his belief in the alimentary factor 30 years ago; and in a review of the recent literature on this subject published in 1923 he had still maintained that defective feeding, and especially over-feeding, played a most important part in the production of rickets. That both lack of sunlight and defective feeding were closely related causes of rickets was advanced by Dr. Apert, who holds that one of these factors is as necessary as the other; but in reply Dr. Variot disagreed with this. It is noticeable that in the report of this discussion no mention is made of any vitamin, and it is probable that the recent work of Mellanby on the apparent antagonism between excessive starchy foods and the antirachitic factor will be taken here as an additional proof (as, of course, it is) of the dangers of overfeeding with starch during the period of growth. This is an illustration of the way in which facts can be made to bear slightly different interpretations according to prejudice.

The Comparative Action of Atropine and the Total Alkaloids of Belladonna.

Differences in the physiological and therapeutical action of the total alkaloids of a plant and of the essential principle are already well known. P. Lemay and L. Jaloustre have tested the action of atropine and of the total alkaloids of belladonna in the rabbit, and have confirmed the facts already noted by Cushny and Rothlin. The total alkaloids appear to be twice as active as atropine in their action on the cardiac wave, and the authors conclude that there is reason to use them in treatment (especially in spasm and vagotony) in preference to the galenical preparations of the codex. The physician has in them a remedy always of the same composition and twice as active as atropine without being more toxic.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Proposed Alterations in the Medical Curriculum.

A SPECIAL committee appointed by the Ministry of Education, in coöperation with the medical faculty of Vienna and the university boards of the three Austrian universities, has worked out a series of suggestions on the future regulation of medical study in this country. The principal change advocated is the extension of the period of studies. Hitherto ten semesters (five years) have been required; but the medical student will now have to work for a year longer at the university and at the clinics before he can take his diploma of M.D. At the end of his fifth semester (half-year) he will take three minor examinations (biology, chemistry, and physiology) and a severe examination in anatomy; after which he will serve during the next two years as junior assistant in various clinics. Here he will obtain practical instruction at the bedside in the modern technique of investigation, under the guidance of regular assistants of the clinical professors. The final examinations will be held at the end of the eleventh and twelfth semesters, and for both these terms the student will be required to serve in clinics. The "hospital year" for the graduated doctor, which has been adopted in Germany and some other countries, has not found favour here. The committee thinks it advisable that the student should have a year of thorough instruction at the bedside before he is granted a diploma which, according to the law, entitles him to settle down and practise. It has been thought wiser not to alter the fundamental legal regulation. Specialisation by the graduated doctor will also be much more difficult than hitherto. He will only be allowed to style himself "specialist" after having spent at least four years in hospital as

interne and assistant after his graduation; and of this period he must have been working for at least three years in the special branch selected. He may then be recognised as "specialist" by the Union of Specialists, which alone is entitled to confer on him this title. It is even contemplated that those present-day specialists who have not obtained a university degree of docent or professor in their special branch should be compelled to pass a (nominal) examination. But this suggestion has met with so much opposition that it will most likely not be enforced.

Insulin Treatment in Cases of Extreme Leanness.

At a recent meeting of the Vienna Medical Society Prof. W. Falta showed several cases in which he had given regular insulin treatment with the intention of obtaining rapid gain in weight. From the very first administration of insulin the appetite was enormously increased, so that the patients were capable of ingesting huge quantities of food. The gain in weight amounted on an average to 1½ kilos per week; and in one case a distinct obesity ensued, so that the treatment had to be interrupted. The absence of oedema indicated that this gain was not a mere accumulation of water. It was, in fact, an apposition of real body substance, as was shown by the presence of layers of fat on the thigh, neck, and abdomen. Only in cases of diabetes was oedema produced by insulin. Prof. Falta pointed out that these observations substantiated his assertions that obesity of a pancreatic (insular) type was very frequent, and that it is probable that insulin—or rather, the organs producing insulin—plays an important part in the mechanism of the regulation of the desire for food. In the ensuing discussion Dr. H. Pollitzer, Dr. Bauer, and Dr. Nyiri reported that they too have observed rapid rise of appetite by insulin treatment. Especially the turgor of the tissues increases rapidly, as water retention without oedema is a practically normal condition which is aimed at in all "feeding up" cures. The insulin treatment must, of course, be conducted in a very careful way, especially in cachectic persons; such individuals are liable to an increased susceptibility to insulin, somewhat similar to that observed in severe cases of diabetes.

Increase of Saturnism in Austria.

Prof. Sternberg recently showed to the Medical Society of this city a woman of 36 years who had suffered for more than eight months from intense headaches, with nausea and frequent vomiting. Mental derangement of the type of a mild mania was also present at times. Slight paresis of the right abducens, a congested fundus in both eyes, and loss of irritability of the vestibular organs were thought to point to a cerebral tumour; but, besides that, a distinct discoloration of the lower lip on its dental aspect, consisting of fine point-like pigmentations typical of plumbism, was discovered. The few teeth present also showed a very distinct but narrow line of the same kind. The history of the patient explained the condition. She was occupied in copying illustrations and drawings for textile fabrics by means of an adhesive dye which contained colophonium, white lead, and soot. The constant use of this mixture had caused a chronic oedema of the brain which produced the symptoms. A course of iodides with intense sweating brought marked relief and the return of normal vision, and all the cerebral symptoms disappeared. In 1836 the name of encephalopathia saturnina was given to this rare variety of plumbism by Tanquerel des Planches. This case gave rise to an extensive investigation in all commercial and industrial enterprises using lead and its derivatives. Especially the use of certain white dyes is fraught with danger, as the workers generally are not aware of the presence of plumbum in them, and are therefore careless. In the discussion following the demonstration, Prof. H. Schlesinger pointed out that before the war saturnism had been quite rare in this country, but that during the last six years there had been a distinct rise in its frequency. Besides painters, file makers, and electrical workers, it affects those employed in potteries. These

use coatings containing a fair amount of lead, because lead-containing varnishes give a better finish to the work. Factories seem to neglect the precautions stipulated by the Industrial Labourers' Protection Law, and it is intended to include industrial lead poisoning in the suggested Labourers' Compensation Act as an accident, so that the factories will in their own interest be forced to pay more attention to this point.

Public Health Services.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Bristol. . .	54,704	47,405	14,996	38,885	16.2
Warrington .	13,117	—†	3,983	4,678	17.8
Stoke-on-Trent. .	50,951	—†	14,120	19,887	23.0

* Excluding dental defects and uncleanness.

—† Not given.

Bristol.

Dr. R. A. Askins, in his dual capacity of school medical officer and deputy medical officer of health, is directly able to maintain the closest coöperation between the medical services of the education and health committees—a matter of great importance in a large community with many health activities. It prevents overlapping and also ensures the continuity of supervision from birth to school-leaving age. The importance of keeping in touch with the child welfare work is exemplified in the special report of the chief assistant school medical officer, Dr. R. R. Garden, on the early rectification of squint by glasses and orthoptic treatment. Seventy-nine children referred by the welfare staff were examined at the clinic; 46 of these were found to be convergent concomitant squints, of whom 12 responded at once by the use of suitable glasses and the others are now under treatment and are mostly improving. As with visual defects so with most incipient abnormalities, early recognition and treatment spells the end of much after-crippling.

Dr. Garden also reports on the outbreak of encephalitis lethargica in 1924. There were 50 cases, of whom eight died. Of the remainder, including a few cases before 1924, 21 appear to have recovered with so far no sequelæ, 19 have more or less severe after-effects—e.g., drowsiness, irritability, lack of concentration, and some loss of control. It is this class which forms a serious educational problem. Institutional care is neither desired nor expedient, yet to return them to an ordinary school, though no doubt advantageous to the individual sufferer, is detrimental to their class mates on account of erratic conduct and partial immunity from punishment. In eight cases the sequelæ—e.g., inversion of the diurnal rhythm, paralysis, intellectual and moral depravity—were so serious that institutional care is urgently required. These figures are comparable with those recently reported among 193 cases in London school-children by Dr. F. C. Shrubbsall, and indicate the severity of this new scourge. Not least amongst the disquieting features is the fact that early cases are often missed or lightly treated on account of the mildness of the acute stage.

Dr. Askins is happy in reporting on the opening of another new and up-to-date clinic, making the fourth now in operation; in addition, there is an orthopaedic clinic where appropriate cases from both the child welfare and school departments are treated on modern lines under Mr. Hubert Chitty. Heart cases

are all seen by Dr. Carey Coombs and Dr. C. E. K. Herapath, who report in detail to the school medical officer; an excellent arrangement when we remember the highly specialised work of recognising early signs of cardiac involvement and the grave consequences following on untreated early carditis. Special schools exist for mentally and physically defective children. Mr. J. P. Harty, the aural surgeon, states that the numbers requiring admission to the special school for the partially deaf show a definite and steady decrease since the aural clinics were opened. There is an open-air school with accommodation for 140 and three open-air classes are daily held and accommodate 84 children. Since the results of this rational treatment are so good, it is hoped that further facilities will be provided. Deaf-mutes to the number of 55 are treated in a residential school, and special classes are held for myopes and the partially deaf with accommodation for 70 and 40 respectively, and 17 blind children are maintained by the committee at outside institutions.

Warrington.

Dr. G. W. N. Joseph states that the percentage of defects is lower than in any previous year, and a table is given illustrating the influence of infant welfare centres. Among the entrants who had attended these centres the percentage of defects requiring either treatment or observation was 15.3, compared with 27.2 among the other entrants. In other tables he shows how greatly loss of attendance from contagious affections, particularly "diet" diseases, has been reduced, the days lost in 1922 being 18,227, whereas in 1918 there were 104,453, nearly six times as many. He points out that apart from the other great benefits there is considerable financial gain to the authority by increase of grant. Much credit is due to the school nurses for their preventive and curative work. A special table shows that in ringworm there has been a reduction both in numbers and in time required for treatment, the latter reduction being related to the use of X rays in treatment.

The figures for visual defects during the last four years are set out in detailed comparative tables; they are, on the whole, fairly constant and do not afford evidence of the increase reported in some other areas. As to their treatment we learn from the report that many children were dealt with by "other methods"—i.e., opticians. Many opticians to-day are well trained in general sight-testing and the fitting of glasses, but the strongly acting ciliary muscle of the child makes refraction without a mydriatic liable to error, and examples of the practical evils arising are well known to anyone with acquaintance of ophthalmic practice. A progressive diminution is described in dental defects—i.e., in the percentage of children having four or more carious teeth (a standard which we hope will soon be felt to be too low). On this basis only 0.32 per cent. are called defective, whereas the standard of the dentist gives 75.7 per cent. One expects some difference between the ideal and the practical working scales, but surely this discrepancy is too marked. The proportion of dental cases treated this year (22 per cent.) is low, and the fee scale, which was largely responsible for the falling off, has been relaxed. The dentist thinks that he should inspect less and devote more time to treatment. It is to be hoped that the projected orthopaedic centre and the special mentally defective school will soon be in working order. For low grade defectives an occupation centre has been established, but this is badly handicapped by lack of a guide, and such centres are never proper substitutes for special mentally defective schools.

The need for remedy of some gross sanitary defects in the schools is emphasised in this report, the tone of which is otherwise optimistic. In certain other respects the arrangements are as yet scarcely worthy of a town of the importance of Warrington.

Stoke-on-Trent.

Dr. R. Hughes has compiled a voluminous report full of apt quotations and original mathematical tables.

Although his interests are wide the consideration of the many topics does not lack thoroughness. He has been unfortunate in the constant changes of staff. No routine inspection has taken place in secondary schools. Dr. Hughes makes some pertinent remarks on the question of overcrowding. He quotes the recommendations of the Council of Ophthalmologists, and agrees with Dr. J. Kerr that progressive myopia is a distinct clinical entity and of great importance. Ionisation of ears is to be started again. Dr. E. A. C. Swainson, assistant school medical officer, remarks on the haphazard treatment which "running ears" usually get.

Stoke-on-Trent is unfortunate in its provision of treatment for enlarged tonsils and adenoids. Out of 1291 cases only 158 received any form of treatment. It has been resolved that the necessary steps be taken to provide for the erection of a school for mentally defective children of the county borough. Dr. Hughes's speculations on the comparative failure of some mentally defective schools are interesting, but his comments on these day schools seem unduly pessimistic. Two special contributions are added—one on the distribution of educational abilities among mentally defective children has some original features; the other on the relationship of Binet test ages to abilities in individual school subjects is of educational value.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 18TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 90; scarlet fever, 1683; diphtheria, 933; enteric fever, 65; pneumonia, 707; puerperal fever, 38; cerebro-spinal fever, 5; acute poliomyelitis, 4; encephalitis lethargica, 52; dysentery, 6; ophthalmia neonatorum, 131. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, 18 from measles, 8 from scarlet fever, 78 from whooping-cough, 18 from influenza, and 20 from diphtheria. There were 50 deaths of children under 2 years from diarrhoea and enteritis, as compared with 44 and 29 in the preceding weeks. In London itself there were 7 deaths from influenza and 6 from diphtheria.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE ASSOCIATION.—The Fellowship announces that there will be a special series of lectures on tuberculosis from October to December. Beginning on August 24th to Sept. 5th, there will be an intensive course in general medicine, surgery, and the special departments at the Queen Mary's Hospital, Stratford. Sessions will be held each day from 10.30 a.m. to 5.30 p.m., including demonstration of clinical methods, groups of illustrative cases, &c. Special opportunities will be afforded to those desirous of obtaining practical study in gynaecology and obstetrics. The fee for the course is £3 3s., or £2 2s. for either week. Courses in progress are: A general vacation course at the Prince of Wales's General Hospital, Tottenham, the fee being £3 3s. or £2 2s. either week, and special courses in nervous diseases and urology at the West End and All Saints' Hospitals respectively. An extensive programme of special courses has been arranged for the month of September. The Seamen's Hospital will give an operative surgery course from Sept. 7th onwards and classes will be held four times weekly. The Brompton Hospital begins a two weeks' course from Sept. 21st to Oct. 3rd, dealing with pulmonary diseases, by members of the staff. There will be an afternoon's course at the Blackfriars Skin Hospital and one at the Infants Hospital, both taking place from Sept. 7th to 19th. At the Royal Westminster Hospital a course in eye diseases will be given from Sept. 7th to 26th embodying instruction in the out-patient department and special lectures and demonstrations on the various branches of ophthalmology. An intensive course at the Westminster Hospital in general medicine, surgery, and the specialties is announced for Sept. 21st to Oct. 3rd. A weekly lecture-demonstration in electrotherapy will be undertaken by Dr. C. B. Heald at the Royal Free Hospital from Sept. 23rd to Oct. 14th. Copies of the syllabus of each of the foregoing courses may be obtained on application to the Secretary at 1, Wimpole-street, W. 1.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BATH.

(Continued from p. 200.)

REPRESENTATIVE MEETING.

MONDAY AND TUESDAY, JULY 20TH AND 21ST.

Memorandum on Coroners' Law.

THE principal subject occupying the attention of the Representative Meeting on Monday was the Memorandum of the Council dealing with proposed Amendments in the Coroners' Law. The chief alterations it is hoped to bring about are the institution of two forms of certificate of death and still-birth: (1) Notification of death by natural causes or otherwise, with duration and general nature of the disease, signed by a registered medical practitioner who has viewed the body; if possible by the one who had attended the deceased during life or had been called in at or about the time of death; and (2) a further report on the cause of death containing any scientific data considered necessary or desirable, such report to be private and only open to inspection by a coroner, medical officer of health, or superior police officer. The registrar, in the absence of the first certificate or in cases where it does not strictly follow the statutory form, would notify the coroner.

The discussion centred mainly around the question of the second certificate, whether there should be any reservation on the form issued to the relatives, and if so, what should be done with additional information. Dr. E. W. G. Masterman (Camberwell) argued that double certification involved an extra burden on the practitioner, annoyance to insurance societies, who, as Dr. J. Stevens (Edinburgh) pointed out, would scarcely be willing to meet claims when they knew that a second and confidential certificate had been posted to the registrar, and chagrin of the relatives at not being able to quote the cause of death as certified. Moreover, the scientific value of the second certificate would be small except in cases where a post-mortem examination had been performed or where there was some factor, such as alcohol or venereal disease, which the doctor definitely desired to keep from the knowledge of the relatives. An amendment to delete the line "State disease" on the first certificate was lost on the grounds that this was a concession to the desire of the relatives to have some general disease term given them as cause of death. The supplementary certificate clause was eventually amended on the motion of Dr. E. R. Fothergill (Brighton) and Dr. P. Macdonald (York) to read:

In addition to the certificate of the fact of death there shall be sent direct to the Registrar-General a further report including further facts as to the cause of death and any scientific data which the practitioner who certifies the death considers necessary or desirable.

Various amendments to modify the suggested fees were thrown out and the remuneration for certification, including viewing the body, was left at the Council's figure of 5s. with additional mileage of 2s.

After a little discussion it was agreed that:

The Representative Body is of opinion that additional death certificates should not be given except at the request of the patient's representatives or after their consent has been obtained.

Representation on the G.M.C.

The Council recommended:

That having fully considered the position with regard to the present constitution and the duties and powers of the General Medical Council, the Representative Body does not consider that the Association should take steps (as suggested in Minute 185 of the A.R.M. 1924) with the view of obtaining a larger number of Direct Representatives of registered medical practitioners on the General Medical Council.

This was accepted by 84 votes to 53.

Payment for Health Certificates for Elementary School-Children.

The Representative Body in 1920 agreed that in the event of a school authority requiring a certificate of inability to attend school from a private practitioner the fee for such certificate should be paid by the authority. The Council recommended rescission of this minute as it appeared not to be consonant with the law. The meeting, however, emphasised again their opinion that this state of things ought to be brought about. Mr. Wallace Henry said that in Leicester no medical practitioner gave a certificate to a school-child under any circumstances. The school attendance officer notified the school medical officer if the absent child were seriously ill; if not, he told the parents to take their child up to the doctor for a decision as to whether school attendance was advisable or not. This plan had worked perfectly well. It was the duty of the education authorities to ascertain why a child was absent. The legal position had been known to the Representative Body all along, and in certain areas the education authority did pay, and it ought to in all.

Fees for Examination of Emigrants.

On behalf of the Council Mr. E. B. Turner proposed:

That the fees chargeable by the medical referees appointed by the Dominions of the Empire to examine proposed emigrants should be as follows: 10s. 6d. for an applicant of 16 years of age or over; 2s. 6d. for each applicant under 16 years, provided their parents or guardians are sailing with them. Not more than two applicants under 16 years of age in one family to be charged for. Applicants under 16 years proceeding alone will be charged 10s. 6d.

This resolution, which was carried, amends the fees adopted in 1923.

Proposed Factory Medical Service.

The proposals of the Council for a Factory Medical Service was discussed, and the following items passed:

1. That there should be a distinct department of occupational hygiene attached to the Ministry of Health, which should include the present Factory Medical Service transferred from the Home Office.

2. That if any changes are made the interests of existing members of the Factory Medical Service should be carefully conserved or compensated.

3. That as a general rule any practitioner hereafter appointed to perform the duties at present performed by the factory surgeons, or duties analogous thereto, should at the time of appointment be in general practice or have had recent experience of general practice.

6. That any Factories Bill should provide for due retention of the powers already possessed by local sanitary authorities in respect of factories and workshops.

7. That so far as practicable all supervision of sanitation in factories, workshops, and workplaces, as defined in the Factories Act of 1901, should not only be retained by the local sanitary authority, but should be extended to all factories.

8. That any Factories Bill introduced should provide that the Regulations and Orders of the Secretary of State having reference to sanitation in factories, shall apply, local by-laws and regulations notwithstanding, and should be enforceable by the local authorities and not by the Factory Department, except in cases of default.

Paragraphs 4 and 5, dealing with transference of the work to local authorities where possible and the desirability of setting up a complete service of occupational hygiene, were referred back to the Council for further consideration.

Drug Addiction.

Dr. J. W. Bone, the representative of the British Medical Association on the Home Office Drug Addiction Committee, reported the proceedings of a B.M.A. Committee on the subject. The Association sent four witnesses to give evidence before the Home Office Committee—namely, Mr. E. B. Turner, Dr. E. K. Le Fleming, Dr. C. P. Symonds, and Dr. Cox, and Dr. Bone placed before the meeting the provisional findings of the Home Office Committee in order to obtain guidance. An interesting discussion ensued, but as the documents have not yet been placed before

the Home Secretary the meeting decided that it would be improper to report the discussion, though useful decisions on the points raised by Dr. Bone were arrived at.

Unqualified Practice.

A motion was brought forward urging amendment of the Medical Acts so that unqualified practice should be illegal, but the meeting decided to pass to the next business.

Nursing Homes Registration Bill.

Dr. E. R. Fothergill, in proposing active opposition to the Nursing Homes Bill, 1925, urged that the Association should refuse support to any Bill that included the following principles: (1) Non-recognition of the local medical profession by the supervising authority; (2) disclosure of private case-records to supervising authority; and (3) inclusion within the definition of a nursing home of premises which are under the control of a registered medical practitioner. To this the meeting agreed, Mr. E. B. Turner pointing out that the original Bill had been withdrawn, as admittedly worded badly, and without doubt the preparation of a new Bill would be preceded by a Select Committee before which the Association would be invited to give evidence.

Remuneration of Assistants.

It was resolved:—

(a) That on general principles the employment in suitable cases of assistants by practitioners is in the interests both of the general public and of the profession; (b) that it is not desirable for a principal to employ an assistant where he is unable to exercise adequate personal supervision over the latter—e.g., in some types of branch practice; in such circumstances a partnership is to be preferred; (c) that the offer or a promise of a future partnership should not be made a reason for paying a lower salary to an assistant; (d) that the minimum commencing salary for a newly qualified inexperienced practitioner, acting as a whole-time indoor assistant to a practitioner, should be £240 per annum, with the addition of board and lodging; and in the case of such a practitioner employed on an outdoor basis, the board and lodging value should be estimated from £120 to £160 per annum, according to the circumstances of the individual case; that the only exceptions or possible exceptions to the foregoing should be in the case where, owing to arrangements made for study leave, or to physical disability or other reasons, the assistant is not able to give full time to the work; (e) that a whole-time assistant should be entitled to not less than two weeks' holiday a year on full pay.

No steps are to be taken at present to make these resolutions the formal policy of the Association.

Fees at Municipal Maternity Hospitals.

It was proposed by the Chairman of the Medico-Political Committee, and resolved to insert the following paragraphs in the report on the Utilisation of Municipal Hospitals for Civil Needs:—

That where the local authority makes provision for the institutional treatment of maternity cases this should be mainly or primarily for serious cases of antenatal complications, for cases requiring major obstetric operations, for cases where isolation and treatment of septic infection is specially indicated, and other cases where the home conditions are unsuitable or dangerous for confinements.

That where a general practitioner is called upon to render assistance at a confinement in a municipal maternity hospital the fees payable to such practitioner should be in accordance with the scale of fees approved by the Ministry of Health for the payment by local supervising authorities to medical practitioners called in on the advice of midwives, under Section 14 of the Midwives Act, 1918.

That where a consultant is called in by the practitioner in charge of the case the fee for the consultation should be three guineas; that the fee for a major operation should be not less than ten guineas.

Salaries for Public Health Posts.

A good deal of discussion arose on the proposed scale of salaries for public health posts; but the various amendments were lost. The chief difficulty as put forward by Dr. A. T. Jones (North Glamorgan and Brecknock) and Dr. Gordon Bell (Sunderland) was the occupation of junior posts by recently

qualified men and women who had had great difficulty in obtaining a situation, and who were submitted to grave hardship and forced to refuse £500 a year offered by county and borough councils. But, as the Chairman of Council pointed out, the scale allowed inexperienced juniors to hold posts at commencing salaries of £500, only demanding that the experience gained by them after their probationary year should be recognised by increased emolument. On the whole, the Association did not wish to encourage the appointment of recently qualified practitioners to public health posts; the scale was intended for those who had had post-graduate experience, often a special diploma, and to whom the local practitioners could look as consulting authorities. Dr. Eustace Hill remarked that many of these posts were blind alleys, as the number of assistants greatly exceeded that of senior medical officers; this must be taken into consideration in assessing the remuneration, as also must the consultant position of these specialists, and the fact that any standard accepted would undoubtedly extend to other branches of medical work. The scale as accepted by the Representative Body is that which appeared on p. 1157 of THE LANCET of May 30th last.

Medical Benevolence.

Some discussion arose on the recommendation of Council to set up a British Medical Association Charities Committee to be constituted and directed according to the following provisions:—

1. The Committee shall consist of the officers of the Association *ex-officio*, three members appointed by the Representative Body and three members appointed by the Council, together with the Editor, the Medical Secretary, and the Financial Secretary.

2. It shall be the duty of the Committee through the machinery of the Association to direct the attention of members to the financial and educational positions which arise as a result of misfortune falling on members of the profession, and to appeal for contributions to meet these positions.

3. All sums obtained in response to such appeals shall be paid to a charities trust fund, the trustees being the members of Council for the time being in office, and shall be distributed to such medical benevolent organisations, and in such amounts as the Committee (subject to the approval of the trustees) shall deem advisable.

4. Contributions paid to the Fund may at the will of the donor either be left to the discretion of the Committee or earmarked for a particular purpose.

Complete unanimity was shown as to the importance and urgency of increasing the support of medical charities, but several members desired that the Association should conduct its own charitable work as the existing bodies were not satisfactorily run. The recommendation of Council was adopted on the appeal of Dr. Bolam, who said that he had had occasion to investigate the working of the Royal Medical Benevolent Fund, and he had found single-minded and devoted officers giving of their energy and often supplementing out of their own pockets the very small sums they were able to distribute; he had been particularly impressed by the work of the Ladies' Guild. The blame was on the profession; these organisations ought to be provided with the sinews of war; he strongly deprecated any assumption of management by the Association, and urged the meeting to help them to get on with the work and to do it cheerfully and freely, for the good of the profession and with no restrictions.

In reply to a question from Dr. Wallace Henry as to the individual voting power of subscribers under the new arrangement, the Chairman said that subscriptions might be earmarked for a certain purpose in which case the individual voting powers would be retained.

Lavatories in Railway Carriages.

It was proposed by Dr. W. Johnson Smyth (Bournemouth), seconded by Mr. Russell Coombe (East Cornwall), and carried without discussion, that the question of the defective ventilation in the lavatories of railway carriages be referred to the Council with power to take any necessary action in the matter.

Whole-time M.O.H.'s.

In proposing a motion—

That the Representative Body is of opinion that it is inadvisable and improper that whole-time medical officers engaged in public health work should be required to undertake duties other than those for which they were appointed, Dr. G. G. S. Johnston referred to a bacteriologist required to do post-mortem examinations and a tuberculosis officer required to examine mentally defective children.

The motion was referred to the Council for consideration.

Sale of Vaccine Lymph.

The following motion was brought forward by the Hendon Division:—

That inasmuch as vaccination against small-pox by means of calf vaccine lymph is the sole obligatory medical operation known to English statute law—abstention being permitted only after statutory exemption has been obtained—calf vaccine lymph be now recognised in the British Pharmacopoeia as a therapeutic substance; that standards of purity, potency, and source of seed used in its preparation be prescribed; that the provisions of the Sale of Foods and Drugs Act be made to apply, and that early Parliamentary action be urged to enable the Ministry of Health to lay down and enforce regulations governing the conditions of the preparation and sale of calf vaccine lymph.

This motion also was referred to the Council.

Preservatives in Food.

Dr. Ridley Bailey announced that a Home Office Departmental Committee on Food Preservatives had been assisted by Dr. C. Porter, of Marylebone, and Profs. Dixon and Clark on behalf of the Association. Certain vested interests had put pressure on the Government against the adoption of some recommendations of the Departmental Committee. It was therefore desirable to strengthen the hands of the Government by a strong expression of opinion from the Representative Body. The following recommendations were agreed to:—

(a) That the Representative Body is satisfied from the experiments made, from the recorded cases, and also from the fact that other countries have discontinued their use, that it is essential in the interests of public health that boric acid and boron compounds should not be used as food preservatives.

(b) That, whilst recognising that there are difficulties inherent in this country, due to the lack of cold storage facilities and efficient means of transport, which do not exist to the same extent in America and other foreign countries, the Representative Body is of opinion that as a matter of principle it would have been better if the example of other countries in prohibiting entirely the use of preservatives and metallic and other toxic colouring matters in foods could have been followed in the Draft Regulations *re* food preservatives, &c., issued by the Ministry of Health.

(c) That the members of the Representative Body draw particular attention to the evils which have arisen in their own experience from the importation of liquid eggs preserved with boric acid, and the Representative Body considers that it is essential from the public health point of view that liquid eggs preserved with boric acid or other preservative should be prohibited at once.

(d) That, subject to the foregoing recommendations, the Representative Body places on record its approval of the Draft Regulations (issued by the Ministry of Health on Feb. 17th, 1925) with regard to preservatives, &c., in food.

Retired Pay of Majors, R.A.M.C.

Sir Richard Luce, Chairman of the Naval and Military Committee, in proposing the adoption of the report of Council under "Naval and Military," drew attention to certain injustices which are present matters of negotiation. Of these the chief concerned the retired pay of majors of the R.A.M.C. This was £1 a day pre-war after 20 years' service, and in 1920 was raised to £396 per annum, but even this was subject to reduction. The War Office was in sympathy with the wishes of the B.M.A. in this matter, but the Treasury had not yet sanctioned the increase

which would make their pension proportionate to that of the rest of the Service. Another difficulty had been the proposal to raise the age-limit in the Territorial Army, which led to a block in the promotion of majors. In the Navy, the negotiation about the gratuity to senior surgeon-commanders compulsorily retired at the end of the war had resulted in the acceptance of £300 by the officers concerned. The Council of the B.M.A. had suggested that a reconsideration of the pay of junior grades might help to overcome the reluctance of young graduates to enter the R.A.M.C., and the Army had replied that it hoped to lay before the B.M.A. at an early date proposals for the improvement of the conditions of service. After several members had condemned the attitude of the Government in this matter, it was resolved—

That inasmuch as the provision for a 20 per cent. reduction in retired pay of majors after 20 years' service under the 1919 Warrant can have the effect of reducing the pensions of many of these officers below the sum of £1 per diem which was provided by the Warrant under which they joined the Service, the Representative Body is of opinion that a serious breach of faith has been committed by the Government, and that, therefore, the Association is unable to recommend recently-qualified doctors to enter the R.A.M.C., and declines to publish the terms and conditions of service in the R.A.M.C. until the Council is assured that this and other matters under negotiation have been settled to its satisfaction.

Hospital Policy.

Considerable discussion was raised by the proposal of the Council to rescind paragraph 10 of the hospital policy, viz.:—

Gratuitous contributions to hospitals by employers of labour or by employees should not be treated as the payment of premiums for insurance against the cost of maintenance and medical treatment for sickness or accident, nor as entitling the contributors to claim hospital treatment, either for themselves or for persons nominated by them, but as charitable contributions to be expended at the discretion of those to whom the management of the hospital is entrusted.

Several members, including Dr. Peter Macdonald (York), Dr. F. Radcliffe (Oldham), Dr. R. D. Mothersole (Bolton), and Dr. J. M. Mitchell (West Bromwich) spoke to the motion, and the provincial members held that the hospital policy as proposed by Mr. H. S. Souttar, Chairman of the Hospital Committee, was not adapted to the conditions of midland and northern hospitals. Nevertheless, the motion of Council was passed by the requisite two-thirds majority, as was also the following new paragraph:—

9. Contributions to hospitals by employers of labour or massed or periodical contributions by employees should be considered as contributions for services rendered or to be rendered.

Dr. A. P. Thomson (Birmingham) proposed:—

That taking into consideration the importance of medical education and the fact that the large teaching hospitals are specially organised and staffed for such work, this meeting is of the opinion that in the scheme of hospital policy of the British Medical Association these hospitals should be put in a class by themselves.

This was referred to the Council for consideration, and it was further agreed:—

That in all cases of accident where medical attendance is given at a voluntary hospital, and such medical attendance is covered either directly or indirectly by insurance, the hospital authorities should recover from the insurance company the full cost of maintenance and treatment of such patient; that where patients who would ordinarily be considered as private patients are admitted to hospital solely on account of accident or emergency they should be considered as "private patients"; and that case-sheets and records of patients treated in hospitals should remain in the custody of the hospital; that they must be regarded as confidential documents and access to them allowed solely to the members of the visiting staff of the hospital.

During the course of the meeting Dr. Brackenbury was elected unopposed to the chair of the Representative Body, and Dr. C. O. Hawthorne was elected deputy chairman.

ANNUAL GENERAL MEETING.

Tuesday, July 21st.

The Annual General Meeting was held in the Concert Hall of the Pump Room on Tuesday, July 21st, when the outgoing President, Mr. J. Basil Hall, inducted Mr. W. G. Mumford as acting President during the illness of the President, Dr. F. G. Thomson.

The report of the Representative Body that Mr. R. G. Hogarth had been elected President for 1926-7 was received, and Mr. Hogarth extended to the Association a warm welcome to Nottingham next year.

Dr. R. A. Bolam, in proposing a vote of thanks to the past President, pointed out that he was the first President of the Association to visit America as an official delegate. Mr. Basil Hall expressed his enjoyment of his visits to the United States and Canada and the pleasure it had given him to occupy the presidential chair in such an active and interesting year. The meeting then adjourned until 7.45 P.M., when Mr. W. G. Mumford took the chair in the Palace Theatre. He was supported on the platform by the Marquis of Bath, Lord High Sheriff of the County of Somerset; Alderman Cedric Chivers, Mayor of Bath; Madame Sarah Grand, Mayoress of Bath; the Venerable Archdeacon of Bath; Mrs. Thomson, Mrs. Mumford, the past President, the President-elect, many members of Council, and the chief officials of the Association. Dr. R. G. Gordon, honorary local general secretary, introduced the two new Canadian Vice-Presidents and several distinguished foreign guests and overseas delegates. The Middlemore prize, consisting of an illuminated certificate and a cheque for £50, was then presented to Mr. Basil Graves in recognition of the contribution he has made to the microscopy of the living eye, especially in relation to the use of the slit-lamp. The gold medal of the Association, for distinguished services, was presented, amidst loud applause, to Dr. R. A. Bolam, chairman of the Council since 1920. Mr. Basil Hall, in introducing him, said that the engrossed testimonial set out many of his qualities and invaluable services, for which all were deeply grateful. His family motto should be "Service, not Self."

The Presidential Address, which appeared in last week's issue of THE LANCET, was then read by the President's son, Mr. Malcolm Thomson, and illustrated by lantern slides. A vote of thanks to the President was moved by Dr. Brackenbury and seconded by the Archdeacon of Bath, both of whom expressed the general admiration of the ability and grace with which it had been delivered. After a vote of thanks to Mr. Mumford, the company were received by Mrs. Thomson and Mr. Malcolm Thomson in the historic Assembly Rooms, where they enjoyed a pleasant social evening.

ANNUAL DINNER.

The annual dinner was held in the Assembly Rooms on July 23rd. Lord Dawson, in proposing the toast "Our Hosts," spoke of the beauty and hospitality of the city of Bath, and referred with particular appreciation to the part played by the Mayor in providing such lavish entertainment. Alderman Cedric Chivers, 695th mayor of the city, agreed with all Lord Dawson had said about Bath and its citizens, adding that the only exaggeration was contained in the reference to himself. The Marquis of Bath proposed "The B.M.A.," remarking on the pleasure it gave him, a layman, to wish the doctors the best of health. Dr. Bolam, replying, spoke of the attitude taken by the B.M.A. with regard to such questions as unqualified practice; he said that the Association must always stand for the interests of the community and must not interfere with the undoubted right of the head of every household to try his hand at healing his own relatives. Sir StClair Thomson proposing "Our Guests" gave a message of welcome from his kinsman the President.

This toast was replied to by Dr. A. J. Orenstein (Johannesburg) and by Dr. W. D. Haggard (president of the American Medical Society). The presentation of the golfing cups by Mrs. Thomson followed. The Ulster cup was won by Dr. G. Brand of Glasgow, and the Childe cup by Dr. W. V. Wood of Yatton. "The President" was proposed by Dr. Brackenbury, who wished Dr. Thomson an early restoration to health, and thanked the acting President, Mr. Mumford, for the way in which he had risen to the occasion in particularly difficult circumstances. Mr. Mumford responded.

EXCURSIONS AND SOCIAL AMENITIES.

The Representative Body were taken by motor charabancs to Stonehenge on Sunday, July 19th, where they were met by Dr. J. P. Williams-Freeman, of Andover, who gave a most interesting and instructive lecture about the monument. An exceptionally large number of excursions and conducted tours were arranged during the week, and visitors were given every opportunity to see the baths and other interesting features of the town and its very beautiful environs.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

WEDNESDAY, JULY 22ND.

Filter-Passing Viruses.

It had been arranged that the discussion on filter-passing viruses at this section should be opened by Dr. W. E. Gye, and after some preliminary words of welcome from Prof. J. C. G. Ledingham, President of the section, Dr. Gye was called upon. He began by explaining that it had been his original intention to speak on the general question of filter-passing viruses, and that he had actually composed a paper on this subject, but that he had since been requested to speak on his special research into filter-passing organisms found in cancer because of the widespread interest aroused by his article in THE LANCET of July 18th. He left it to the meeting to decide on which subject he should speak. Cancer was demanded with a unanimous voice, and Dr. Gye put aside his paper on filter-passing viruses and spoke for 20 minutes on his recent researches.

Up till recently, he said, we have been satisfied with the general conception that in order that disease may occur it is sufficient to bring together host and parasite. Though this holds good for many contagious diseases, it breaks down when applied to many bacterial diseases, particularly those due to anaerobic bacteria. Thus the tetanus bacillus, washed free from toxin, becomes harmless to laboratory animals. A mouse is not made ill by tetanus bacilli alone, but is killed by those germs if at the time of inoculation some tetanus toxin be also present. Although less clearly established, there is much to suggest that a similar third factor exists for diseases other than anaerobic infections. For example, 10 per cent. of the inhabitants of this country carry the cysts of amoebic dysentery; yet no epidemic occurs. We do not know the conditions which determine the onset of amoebic dysentery. Clearly the conjunction of host and parasite is not sufficient to cause it. An equally suggestive field for speculation is provided by cerebrospinal fever. During war-time outbreaks of this disease it was sometimes found that 50 per cent. of contacts harboured the specific germ yet remained well.

Dr. Gye then turned to the question of the specificity of malignant tumours. It is known that all species of animal are liable to cancers, yet hitherto cancers have only been successfully passed from one animal to another of the same species, and only by the medium of living cancer cells. Thus a tumour arising in a mouse may be transmitted by living cells to another mouse, but not to a rat. This strict specificity has always appealed to the pathologist as an almost incontrovertible argument against the hypothesis of a

living agent as the cause of cancer; yet there remained one experience, an apparent exception, which forbade the dismissal of the germ theory of cancer. In 1911 Peyton Rous discovered that the filtrate from a chicken sarcoma tumour would produce sarcoma in fowls of the same breed. This was the first definite evidence of malignant tumours being transferred by other means than the injection of malignant tumour cells, but two other tumours were subsequently described which could be handled in a similar way. These three tumours differed radically in their characters. Thus the first was an embryonic type of sarcoma, the second an osteo-chondro-sarcoma (changed, by passage, from a benign to a malignant growth), and the third was a spindle-celled sarcoma with peculiar rifts running through it. All these could be diluted with saline and filtered, yielding an infective filtrate—but this was infective only for birds of the same species. The active filtrate always produced a tumour of the same character as that from which the filtrate was derived, and this specificity forced the conclusion that each type of tumour sprang from a separate type or species of virus. In defending other manifestations of cancer from the germ theory, orthodox pathologists argued that this strict specificity necessitated the postulation of a separate virus for every type of animal or plant tumour, an argument which seemed to reduce the germ theory to an absurdity.

Turning now to his own work, Dr. Gye gave a brief account of his recent researches. He described the method he had discovered for separating the filtrate of a chicken sarcoma into two fractions, each inactive without the other, but causing a malignant growth when both were injected. Thus by spinning the filtrate at about 9000 revolutions per minute, and washing the deposit obtained, he supplied himself with two fractions, a washed deposit and supernatant fluid. Neither of these would cause sarcoma by itself, but they were infallibly active when combined. This experiment, he declared, he had repeated many times, and he has come to look upon it as a key to the understanding of tumours. The next stage of his research was the production of tumours in mammals with cell-free filtrates. Previously this had not been accomplished for rat and mouse sarcomas; but Dr. Gye found that a tube of culture-media to which a piece of one of these tumours was added, possessed, after filtration, the capacity for inducing malignant growth. This proved that mammalian tumours do not differ essentially from the tumours of birds described by Rous. He was able to show finally that the same principles hold for mammalian tumours as for sarcomas of birds, and that two separate elements are necessary for the successful transmission of the tumour—(1) the living virus, and (2) the specific substance derived from the parent tumour.

Dr. Gye was followed by Mr. J. E. Barnard, who spoke on the microscopical examination of filterable viruses. Our readers have recently had the opportunity of studying the masterly exposition by Mr. Barnard on this subject (THE LANCET, July 18th), and his remarks at Bath covered the same ground as this paper.

Dr. M. H. Gordon pointed out that there are two obvious criteria wherewith we can differentiate viruses—namely, (1) their highly specialised pathogenicity, and (2) their specific immunising action. Three years ago he had submitted a paper to this section of the B.M.A. meeting at Glasgow on the influenza virus, but owing to lack of material, ignorance of how to handle the virus, and the difficulty of recognising the disease in the inoculated animal, he had abandoned this study and resorted to a humbler virus, a supply of which was always available—namely, vaccinia. For the last three years he has been studying this virus by the experimental method and the results have been embodied in a report to the Medical Research Council which is now in the press. Dr. Gordon showed a number of lantern slides illustrating the methods used in this research and some

of the results obtained. The main conclusions to which this work has led are, first, that both vaccinia and variola viruses are particulate and largely retained by the Berkefeld filter. He declared that the presence and abundance of the virus can be measured, within limits, by the quantitative virulence test and by such serological methods as complement fixation and agglutination. He has satisfied himself that active immunity can be produced to vaccinia with either attenuated or killed virus provided the dose is sufficient. He reported some remarkable instances of the capacity of vaccinia to excite acute nasal catarrh. He noticed that the flocculi deposited from suspensions of vaccinia or variola virus by specific agglutination are composed of spheroidal bodies closely resembling those Mr. Barnard found in cancer cultures. Similar bodies have been found in flocculi from precipitin reactions. Further investigation along this line was not made, the immunity and serological questions being the chief preoccupation of Dr. Gordon's research.

Dr. Gordon was followed by Dr. J. E. McCartney, who began by saying that Dr. Gye was fortunate in having selected for study a tumour that could be examined under experimental conditions in its proper host. To learn more of the nature of filter-passing viruses we must turn to the simplest and those most easily studied, such, for instance, as the virus of mosaic disease of tobacco and tomatoes. The difficulties of work with human virus diseases was exemplified in his own experience with influenza, measles, common colds, and febrile herpes. All these diseases, not being natural infections of laboratory animals, offer perplexing difficulties, and it often remains extremely difficult to say with certainty whether or not the disease has been transmitted. Dr. McCartney explained the failure of the filtration of brain tissue from rabbits dead from herpetic encephalitis as being due to the fact that the lipid material from the brain is in a state of colloidal suspension, and the pores of the filter become clogged with it. If, however, a small piece of the infected brain be placed in a tube of 2 per cent. glucose broth and incubated for 48 hours at 37° C., the virus passes out of the brain tissue into the surrounding broth, which, if filtered through a Berkefeld filter, is found to have retained its infective power. Dr. McCartney was emphatic that cloudiness in Smith-Noguchi medium does not necessarily mean virus growth, as this is frequently seen in sterile uninoculated control tubes. Smith-Noguchi medium, except for the growth of "globoid bodies" of poliomyelitis and *Bacterium pneumosintes*, is unsuitable for the cultivation of filterable viruses. The granules seen in stained films from cultures are not the actual virus. Animal experiment is the only reliable test for the presence of filterable viruses, but in this work the importance of adequate controls cannot be over-estimated, as proved by a recent experience in which a virus disease appeared in experimental animals, a virus which was not aetiologically connected with the disease being studied.

Discussion.

At the conclusion of Dr. McCartney's paper a discussion took place, in which the following took part: Dr. J. A. Arkwright, Dr. M. Coplans, Dr. R. P. Garrow, Prof. Ledingham, Dr. Manson, Dr. J. Menton, Dr. Pybus, and Dr. Stephens.

At the President's suggestion the discussion was conducted in an informal fashion, and, for the most part, it took the form of questions which were addressed to either Dr. Gye or Mr. Barnard or Dr. Gordon. Neither Dr. Gye nor Mr. Barnard could be persuaded to go beyond their written word. Dr. Gordon and Prof. Ledingham both spoke on their recent researches on vaccinia. Dr. Coplans spoke of the differences which exist between different filters and pointed out many possible fallacies in filtration experiments.

SECTION OF MEDICAL SOCIOLOGY.

FRIDAY, JULY 24TH.

Standardisation and Purity of Milk.

This section, under the presidency of Dr. C. E. S. Flemming, devoted two sessions on July 24th to the subject of milk-supply. The morning discussion was opened by Dr. R. Stenhouse Williams, of the Reading Institute, who said that the educational effect of the examination of milk might in time largely obviate its necessity as a control; for its own good the industry would offer only the best to the consumer. Bacteriological standards for cleanliness of milk were only introduced into England in 1917. At that time sufficient work had been done to justify a tentative standard for Certified milk of 30,000 per cubic centimetre and the absence of *B. coli* in two out of three tubes of one-tenth of a cubic centimetre. In New York the numerical standard was 10,000, and there was no standard for *B. coli*; he thought that the English standard, by the inclusion of the *B. coli* test, was a better means of controlling methods of cleanliness. As time progressed, and with the introduction of the Dairies Act of 1922, it had become possible to lay down further standards for different grades. The *B. coli* test did not apply to pasteurised milk. Dr. Williams then gave a series of results obtained at different periods of the year. These showed that it was possible to maintain the Ministry's standard for Certified milk, and that clean production depended not so much on the buildings and equipment as upon the skill of the workers and the unflinching interest of the farmer or milk dealer. The Ministry of Agriculture had done much to create this skill and interest—by demonstrations at cattle shows, by the distribution of literature, and, most of all, by the ever-increasing number of clean-milk competitions. In arranging these competitions it was desirable that they should continue for a long period—e.g., six or twelve months—so that a new habit of mind would have time to develop. Results hitherto obtained had shown the great value of bacteriological examination, by which alone it was possible to rescue the work from a fog of talk. The Ministry of Agriculture was encouraging agricultural colleges and county educational authorities to appoint agricultural organisers, who would not only carry out bacteriological tests but would go down to the cowsheds and the premises of the dairymen to study the conditions under which the work was done. Several such appointments had already been made.

Dr. W. G. Savage (county M.O.H., Somerset) said that the public health administrator made four demands on milk supplied: (1) That it shall not transmit infectious diseases; (2) that its nutritive qualities shall be maintained; (3) that no chemicals shall be added to it to the prejudice of the consumer; (4) that its price shall be as low as practicable after the above three postulates have been satisfied, so as to be readily available for the community. The third demand had been already met by the legislature.

He thought that bacteriological standards should be used as a help to the trade and for picking out the worst cases. He was not yet in favour of a fixed bacteriological standard, non-compliance with which should be a punishable offence—the method adopted in the U.S.A. As regards the nutritive quality, it was well known that the average fat-content of milk, as judged by the examination of samples, was about 3·6; whereas the presumptive standard was only 3 per cent. If the presumptive standard were made a legal one, it would be unfair to the smaller purveyors and producers. The big companies with skilled staffs and working with large quantities of milk would be able to reduce their milk to the standard to a nicety; whereas the small man would be unable to hit the happy mean between a profitable abstraction of fat and an excessive but illegal removal. Milk producers who delivered milk below the standard should receive prompt notice, and the mixed milk of the herd should be sampled before any question

of prosecution arose. Dr. Savage also considered that reasonable methods should be gradually introduced for keeping up the vitamin content of the milk. If we freed ourselves from the demands of extremists, there was nothing to prevent the milk-supply being rendered safe without an appreciable increase in cost. The Committee on Milk Production had pointed out eight ways in which cost might be lowered, one of which was the elimination of unprofitable cows by means of milk recording. Undoubtedly the cost of the supervision of the milk-supply would be increased by the new proposals. This, however, would not fall upon the milk trade, but rather on the general public health expenses of the country, and therefore it would not affect the price of milk.

Dr. Eric Pritchard spoke from the point of view of the clinician. Although milk was such a valuable food that any attempt by legislative or other means to attain Utopian ideals of cleanliness, irrespective of cost, would be little less than a national calamity, it was at the same time without question the most dangerous vehicle for the conveyance of infectious disease. Experience in this country and in the U.S.A. had shown that the commercial production of a raw milk, which is safe from this point of view, is an impracticable proposition. Complete safety could only be obtained from milk rendered sterile immediately before consumption. If we were prepared to dispense with absolute safety and to accept relative safety, the only solution was the commercial pasteurisation of the whole milk-supply. The old boggy that the nutritive qualities of milk were seriously prejudiced by the process of pasteurisation had, he hoped, been finally disposed of. For his part he was well satisfied with the standard required under the Milk Designation Order (1923), provided that the pasteurisation of all milk not reaching the Grade A standard was made obligatory.

Discussion.

Mr. Wilfred Buckley (National Clean Milk Society) stated that if cows got sufficient food it was impossible to increase the fat-content of the milk by choice of food. He did not see how the vitamin-content could be kept up during the winter. In his herd of about 80 cows the milk frequently contained less than 3 per cent. of fat, although the average was well up to 3·6 per cent. He did not believe that the practice of "toning" down the milk was in operation. Mr. Quinton (sanitary inspector, Liverpool) spoke in favour of the value of methods as contrasted with structures for producing milk with a low bacterial count. He believed that "toning" was practised. Mr. Ben Davis (United Dairies) said the home was the worst source of contamination. There was no "toning" of milk. The records of his company showed a progressive improvement in the cleanliness of milk supplied to it, as shown by bacterial count. Mr. J. C. Coleman, M.R.C.V.S. (Swindon), drew attention to the high charges made for the distribution of milk and to the impossibility of cleaning milk once dirtied. Mr. Tusting (lecturer to the United Dairies Co.) said he had leave to refer to an experiment recently carried out by the Medical Research Council showing the great improvement in school-children resulting from the addition of extra milk to their diet, and the fact that there was no deterioration in properly pasteurised milk. The report would be published in the autumn. Chicago was now supplied with 98 per cent. pasteurised and 2 per cent. Certified milk.—Mr. S. R. Whitley (British Dairy Farmers' Association) appealed to the doctors to say "Drink more milk."—Dr. H. Scurfield agreed that we should drink more milk; but in order to achieve that object the doctors must be convinced that the milk was safe. The protection of milk in the home was not the subject for discussion. The suggestion that the milk was contaminated in the home was no excuse for the delivery by the trader of contaminated milk.

Dr. Stenhouse Williams and Dr. Savage replied. Dr. Savage did not think, from his experience in Somerset, that distributing companies made any effort to encourage the farmers who supplied them with milk to deliver it in a clean state. He still thought that "toning" was practised.

The morning session concluded with the exhibition of two films showing methods of clean-milk production on the farm, and of pasteurisation on a big scale.

Milk-supply and Cost.

During the afternoon the section continued the discussion on milk-supply and cost. Mr. Wilfred Buckley spoke from the producer's standpoint. It was for various reasons at present impossible for the majority of farmers to maintain tubercle-free herds. Mainly by the Government's efforts the number of tubercle-free herds had increased from two or three to upwards of 250; but tubercle-free milk was unlikely to become general in this generation's life-time. Decent cleanliness was, however, practicable, and by coöperation the entire milk-supply could be raised to Grade A standard. The public should be educated to require this standard. He estimated that clean methods on the part of the dairy-farmer cost about $\frac{3}{4}$ d. per gallon and that the sterilisation of apparatus cost about $\frac{1}{4}$ d. per gallon, and that a further expenditure of 2d. per gallon was necessary to maintain a tubercle-free herd. Mr. Buckley made a strong protest against the doctrine of Dr. Clive Riviere, expressed at the recent Tuberculosis Conference in London, that raw cow's milk should be given to infants in the hope that it contained a few bovine tubercle bacilli and might therefore produce a certain immunity against the human bacillus. Ordinary raw milk might contain no tubercle bacilli, or it might contain an excessive dose. Such a proposal was therefore quite unscientific.

Mr. George P. Male, M.R.C.V.S. (Reading), speaking as a veterinary surgeon, said that he was satisfied that the use of the tuberculin test, together with proper facilities for isolating reactors and for the breeding and rearing of non-tuberculous young stock, could be relied upon to secure a healthy herd within a reasonable time. It was much to be hoped that the Medical Research Council would be able to evolve a test which would be less expensive for the owner. The number of reactors found in a herd might vary from 5 per cent. to 90 per cent. It was a sound economic proposition to make a herd tubercle-free for many reasons. (1) The loss from wasters may amount to £300 a year in a herd of 50 cows. (2) Tubercle-free cows hardly ever need the help of a veterinary surgeon. (3) The average life of a tubercle-free cow is longer. (4) Cows suffering from a wasting disease like tuberculosis are more expensive to feed. (5) In the case of pedigree herds animals cannot be sold to foreign buyers unless they pass the test. (6) When a cow is tuberculous, sooner or later tubercle bacilli will find their way into the milk. When this occurs the owner will have to take steps to find the offending cow or cows. He may have his milk banned, or, under the new Act, he may be fined or lose his licence. (7) There is a ready sale at enhanced price for young stock from tubercle-free herds. (8) When sold to the butcher there will be no loss for subsequent condemnation. The public was now beginning to realise the value of clean milk from healthy cows and to be prepared to pay for it. Mr. Male believed that the production of Grade A tuberculin-tested milk cost the producer less than 3d. per gallon extra, and there was no reason why this milk should not be used by all. The producer, however, was waiting for a market, and the distributor for an assured supply. If medical men throughout the country recommended this class of milk, the whole of the milk-supply would be revolutionised.

Mr. J. H. Maggs (chairman of the United Dairies Co.) said that the volume of milk from tuberculin-tested cows was not likely within this generation to

exceed a small percentage of the whole. He hoped something would come from the Spahlinger method of immunisation. He thought the reintroduction of the Tuberculosis Order would involve a sheer waste of public money. The sheet anchor of the distributors would for long be pasteurisation. He thought they should go slow with the idea of a maximum count; but that, as time went on, they would be able to lower the counts and make the examination more stringent.

Prof. Walker Hall (pathologist, Bristol Infirmary) said the Government standards were tentative, and could be tightened up gradually. Patient education of the staffs engaged in the milk trade was necessary. Progress had been slow in Bristol during the last 16 years, but more rapid recently. They must help rather than prosecute the farmer.—Mr. Cumber (farmer, Reading) believed that bovine tuberculosis could be eradicated in 20 years. A penny per gallon would pay for clean milk methods and 2d. per gallon for the added cost of maintaining tubercle-free herds.—Mr. Boutflour (agricultural organiser, Wiltshire) spoke on the great educative value of clean-milk competitions. The large proportion of reactors so frequently found in a herd was a legacy from past days of over-milking, bad feeding, and bad housing.—Mr. J. R. Catmar, M.R.C.V.S. (Abingdon), said there was very little clean milk and that much was still produced under appalling conditions.—Mr. Quinton testified that the Tuberculosis Order of 1914 was a valuable measure during the period when it was in operation.—Mr. Coleman said that tuberculin testing was often inefficiently done. Also there was the difficulty caused by doping.

Conclusions.

The speaking clearly indicated the variety of interests represented, which included the National Farmers' Union, the British Dairy Farmers Association, the Sanitary Inspectors Association, the United Dairies Ltd., and the Association of Women Sanitary Inspectors and Health Visitors. To anyone who had attended the milk conferences held in this country during the past four or five years it is obvious that some progress towards a better supply has been made, and that the Ministry of Agriculture is actively promoting better methods. But it is equally obvious that much remains to be done to educate the public (1) in the need for cleaner milk, and (2) in the greater use of milk as a food.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

The usual exhibition was held in the Markets from July 21st to 25th. It was opened by Mr. W. G. Mumford, F.R.C.S., on behalf of the President-Elect, in the presence of a large gathering of representatives and visitors, on Tuesday morning. The Mayor of Bath (Mr. Cedric Chivers, J.P.) offered his congratulations to the Association on the great improvement in the Market Hall brought about by the floral and other decorative effects. Mr. Mumford said that one of the most important factors in the success of an annual meeting was the existence of such a commercial and educational exhibition as that before him. The advance of science had made it a far more complicated undertaking than in previous years, and this year some 86 stalls were furnished.

CANCER RESEARCH IN MANCHESTER.—For several years cancer research has been carried on in Manchester by the Christie Hospital, by the Pilkington and Helen Swindell's trust at the University, at the Radium Institute, and at the Royal Infirmary. The various research agencies are now coöordinated by a committee which proposes to extend them. Dr. R. Veitch Clark (M.O.H., Manchester) is chairman of the general committee, Sir William Milligan is chairman of the executive, and Dr. E. M. Brockbank is chairman of the research committee. The work will have the strong support of the Ministry of Health, and a considerable programme has been arranged.

Correspondence.

"Audi alteram partem."

DISABLEMENT FROM CHRONIC RHEUMATISM.

To the Editor of THE LANCET.

SIR,—All those who are employed in physical treatment must have read with interest the letter on this subject in your issue of July 11th, for the nature of our work brings before us this particular class of sufferer in bulk. The amount of disablement and of suffering due to this cause is appalling, and the sooner something definite is done to reduce both the better. The object, however, of this letter is to emphasise four particular methods of alleviation.

(1) It is remarkable how many patients with non-articular rheumatism are found to be suffering from an habitual low fluid intake. Indeed, among women particularly, this error in diet would seem to have far more important bearing on the development of their rheumatism than any other single factor. Anyway, this much may be said, that while the daily fluid intake is reduced, and many of these patients habitually consume under a pint and a half a day, no form of physical treatment will help them. As soon as the intake is increased to four or more pints a day, other causes being absent, treatment becomes efficacious. This, of course, is simply a question of education, but one which is terribly neglected.

(2) The letter draws attention to the part played by endocrine disturbance in many of these cases and suggests, as did an annotation in THE LANCET of May 9th (p. 986), the possibility of endocrine therapy. This has, I think, been unquestionably established, although perhaps little realised. In a large percentage of the non-articular type of case, even when the fluid intake is adjusted, patients seem to develop a new focus of pain directly the old one has been cleared up. For some two years now it has been my custom, when this story becomes evident, to ask Dr. H. Gardiner-Hill to investigate the metabolism, and the frequency with which physical treatment becomes curative and not palliative as the result of scientific dosage with pituitary and thyroid has been most striking. Time after time complete failure has been turned into striking success. The same applies, only in lesser degree, to the articular varieties.

(3) Occasionally in similar cases metabolism is reported as correct, and, in the absence of obvious focal bases of infection, it is necessary to turn to less obvious foci. To the most important of these attention was drawn recently by Dr. A. E. Cumberbatch and Dr. H. Robinson at the Royal Society of Medicine in a communication which attracted far too little notice—namely, the value of diathermy in disinfecting the cervical canal. By this means again, time after time, apparently hopeless cases have proved to be completely curable, or, if not, the progress of disease has been arrested.

(4) It must not be forgotten that all cases of so-called rheumatism are not what they seem, and no form of physical (or medicinal) treatment which aims at the cure of rheumatism will cure either lumbago or the pseudo-sciaticas that are due to lesions of the sacro-iliac or lumbo-sacral joints.¹

Of course, these four suggestions as regards possible treatment cannot in any way be supposed to touch more than the fringe of the trouble. There will still remain innumerable cases with which we shall have to grapple where infection arises from nose, teeth, tonsils, chest, and abdomen. The first and last often present apparently insuperable difficulties in their present state of our knowledge. But even so, a large

amount of suffering and incapacity could be saved by the regular consideration even of these four points alone. I am, Sir, yours faithfully,

JAMES MENNELL.

Park-crescent, Portland-place, W., July 20th, 1925.

ANURIC DIABETIC COMA.

To the Editor of THE LANCET.

SIR,—In his valuable paper on the above in your issue of July 11th, Dr. A. C. Begg states that "clinically, the most prominent symptoms were vomiting, restlessness, and feeble, quick pulse." This is distinctly interesting; it brings the cases of anuric diabetic coma more or less into line with the toxæmia arising in acute intestinal obstruction. In this latter condition the impaired renal function has been imputed to an absorption of toxic proteoses formed in the distended gut; but I have shown that the absorption of such proteoses is unreasonable, and, moreover, that the evidence on which the opinion of the renal impairment was assigned (put forward by one set of workers at least) is untenable.¹ I put forward the plea that in acute intestinal obstruction the renal (and probably the hepatic) impairment is the direct result of the vomiting, straining, restlessness, and doubtless the abdominal distension. It occurs to me that the vomiting and restlessness in diabetic coma or in the pre-comatose state may be the effective cause, determining the anuria which Dr. Begg has occasionally noticed in his cases.

In spite of the fact that marked and persistent vomiting, however caused, makes people feel very ill, as, for instance, in prolonged sea-sickness—as many of us from our own experience can testify; in spite of the pernicious effect of marked and persistent vomiting in patients recovering from post-operative anaesthesia—patent to all surgeons; in spite of the fact that in pregnancy, persistent vomiting causes a toxæmia—an hepatic and renal derangement—as shown by the effect of stopping the vomiting—an end admitted of pre-eminent importance by all obstetricians; the idea that vomiting is a pathological force has not been received by the profession as reasonable. In this age of serums, vaccines, and toxæmias, in which so many diseases are imputed to endolytic poisons, physical causes are discounted. Yet what a toxæmia arises in uncompensated valvular cardiac disease; in pulmonary pathological processes (e.g., emphysema); in obstruction of the biliary and renal systems! Cut off or greatly diminish the blood flow through a part, how can it function normally, or the whole body be well?

It is true that Dr. Begg states that all patients with diabetes going into coma or already comatose, whether anuria arise or not, usually vomit; but I take it from his statement that the prominent symptoms of the anuric type are vomiting and restlessness, &c., that the vomiting and restlessness in these is greater than in the other, the non-anuric type. To understand how persistent vomiting can affect the kidney, we must realise that the blood in the renal artery has a choice of two paths: it can either go through the cortex or through the medulla (via the arteriæ rectæ); and that this choice is determined by the respective resistances in the cortex and medulla. When we remember that the urine is secreted in the cortex and flows through the medulla, so do we see that the pressure in the cortex (however small be the difference) must be greater than that in the medulla (as Brodie believed). With the compression of the kidney by the act of vomiting, all these channels for the moment are either obliterated or greatly narrowed, or tend to be; with the relief of the compression which follows the act, if the pressure of the urine in the medullary uriniferous tubules is less or much less than that of the blood in the arteriæ rectæ, so will the medullary capillaries be distended

¹ THE LANCET, Sept. 22nd, 1917, and April 19th and 26th, 1924.

¹ The Toxæmia of Acute Intestinal Obstruction. H. K. Lewis and Co. 1923.

with a pressure effectually blocking the exit of urine from the cortical uriniferous tubules.

Clifford White has shown that in puerperal anuria (or oliguria) the renal tubules in the cortex are dilated; I have confirmed this in an experience of my own (not yet published). Dr. Begg states that in his cases of anuric diabetic coma the symptoms were those of obstructive suppression of urine. In these cases "certain changes" have been found "which suggest the kidney is an all-important factor." He promises us a further contribution on this part of the subject, which will be awaited with restless interest. Meanwhile, may I make two suggestions? The one is that Dr. Begg, in his cases of diabetic coma, should regard vomiting as an important pathological force, prone to determine renal aberrations. The other is clinical: that patients with this disease and impending complication should be placed on their side; that all means be adopted to limit or prevent vomiting; and that in the worst cases decapsulation of the kidney should be done. If the patient is to die, it makes no difference whether this event occurs in the theatre or ward; in eclampsia, patients almost in extremis have been saved by decapsulation; in diabetic coma, if the blood-sugar has been made to become normal by insulin, the objection to operation surely subsides. Decapsulation acts by relieving the cortical pressure (in which the capsule of the organ plays an important part); it allows blood to flow again through the cortical vessels, which distension of the uriniferous tubules prevented; and since blood can now flow through the cortex, there is less to go through the medulla; thus the block is removed, the vicious circle broken.

I am, Sir, yours faithfully,

Rugby, July 11th. R. H. PARAMORE, F.R.C.S. Eng.

To the Editor of THE LANCET.

SIR,—Dr. A. Clarke Begg classifies diabetic coma into two groups: one the usual type with acidosis and normal blood-urea; the other, the anuric type with slight or no acidosis, very high blood-urea, very high blood-sugar, and urine volume decreased even to anuria. This classification does not seem to me adequate. Last year Dr. E. F. Skinner and I reported in your columns¹ a case of diabetic coma with anuria, under the care of Prof. A. J. Hall, which cannot be placed in either of Dr. Begg's groups. The blood analysis in this case on admission yielded the following results (per 100 c.cm.): Blood-sugar, 0.957 g.; blood non-protein nitrogen, 110 mg.; plasma bicarbonate, 15.7 mg.; ketone bodies, 59.13 mg.; blood chlorides, 0.465 g. The low plasma bicarbonate and the degree of ketonæmia indicated a severe grade of acidosis not found in Dr. Begg's cases. Otherwise the findings are similar to those he observed in the cases of coma associated with anuria. It seems, therefore, necessary to consider at least two types of "anuric diabetic coma" according to the degree of concomitant acidosis.

I am, Sir, yours faithfully,

Sheffield, July 19th, 1925.

C. GRAY IMRIE.

TUMORS AND CANCERS: A COMPLAINT.

To the Editor of THE LANCET.

SIR,—In your issue of May 23rd is a review of a work by Mr. Hastings Gilford on "Tumors and Cancers." This review struck me, as it has struck others, as an unjust and misleading statement of the nature and scope of the book. It conveys the impression that it is written by one who is himself a cancer researcher, in the narrowest sense of the word, and has taken advantage of the opportunity to make an onslaught on a book distinguished by its breadth and catholicity of view and which therefore puts his own particular work into its proper perspective. Some of his remarks were written obviously with the intention of creating prejudice. Thus one of the undoubted,

if unavoidable, faults of the book is its bulk, but this bulk is largely due to the evident determination of the writer to support every statement with an ample backing of evidence. It is therefore an obvious and flagrant misstatement to say that the author's conceptions "are so often supported by simple assertions, by bad reasoning." Indeed a more logical or rational exposition of a difficult subject it would be hard to name. Such a statement could only have been made by one who had confined his reading to the "conclusions" and to mere glimpses at the main structure of the book. As for the other comments, some, such as that about alcohol, which is a truism, could have no other purpose than to bias the reader against the book. Then there is a grave and palpable omission. The reviewer is so occupied in his search for weak spots or for sentences which can by dislocation be made to appear gauche or ridiculous that he fails to do justice to the merits of the book. He dwells on those theoretical aspects and frills which he finds so disagreeable and says next to nothing of the real structure. In short, he displays his own personal feeling, but does not review the book.

Now, Sir, I should not have drawn attention to this subject now were it not for the circumstances that such a book as the book in question is so much needed at this juncture in order to form a background for recent achievements in laboratory research. It is therefore exceedingly unfortunate that an important volume containing such a recent and balanced outlook and review of cancer work in all its aspects should have been treated so scurvily by your reviewer.

Finally I may add that in writing as I now do I am expressing not only my own opinion but those of others who are equally impressed with the injustice that has been done and with the desire that the information contained in "Tumors and Cancers" should not be suppressed but should be broadcasted to all who wish to take a sane and just view of the present situation.—I am, Sir, yours faithfully,

Basingstoke, July 26th, 1925.

NOLAN DALY.

THE REMUNERATION OF R.A.M.C. OFFICERS.

To the Editor of THE LANCET.

SIR,—The action of the British Medical Association with regard to the Royal Army Medical Corps recalls their similar action a few years ago with regard to the Royal Naval Medical Service. It is further an admitted fact that there is great difficulty in obtaining medical men for all three combatant services. It is to be hoped that the present dispute will lead to an exhaustive investigation of the lack of attraction to these great services. In my opinion a supply of good men will be obtained only if the opportunities to do first-class medical and surgical work and to keep themselves abreast with advances in their professional work are afforded. Such opportunities under existing circumstances are quite inadequate. Some time ago I submitted a comprehensive scheme to a committee, which included the Directors-General of the three medical services. It was damned with faint praise; but I do not despair that some such scheme may yet receive the official benediction.

I am, Sir, yours faithfully,

J. HERBERT PARSONS.

Queen Anne-street, Cavendish-square, W.,
July 23rd, 1925.

AN ACKNOWLEDGMENT.

To the Editor of THE LANCET.

SIR,—In connexion with the second edition of the "Encyclopædia Medica," Vol. XIII., article Diabetes, we have to regret that on p. 641 an acknowledgment was not made of the nomogram there represented to Dr. W. M. Feldman and Mr. A. J. V. Umanski, the authors of the article in THE LANCET, Feb. 11th, 1922, p. 273, where the nomogram originally appeared.

We are, Sir, yours faithfully,

Edinburgh, July 23rd.

W. GREEN AND SON, LTD.

¹ THE LANCET, 1924, i., 14.

Obituary.

HARRY DRINKWATER, M.D., F.R.S. EDIN.,
M.Sc. (HON. CAUSA) WALES.

Dr. Harry Drinkwater, who died at his residence in Wrexham on July 11th at the age of 70, received his medical education at the Universities of Durham and Edinburgh, qualifying in the year 1877. Eight years later, at the M.D. Edin. examination, he took a gold medal for his graduation thesis. In 1890, after several years of practice at Sunderland, he removed to Wrexham, and was appointed physician to the Fever Hospital there. He became closely interested in the clinical diagnosis of diphtheria and other exudations in the throat, and in a carefully illustrated paper contributed to our columns in 1920 he showed how the distribution of patches of membrane may serve for provisional diagnosis of a very high degree of accuracy before bacteriological examination can be made; and, although some of his views were criticised, he gave good reason for his belief that diphtheria can be diagnosed without bacteriology. Dr. Drinkwater was a man of wide interests, a justice of the peace for the borough of Wrexham, a Vice-President of the Chester Natural History Society, and a member of the Linnean Society. Not long ago he presented to the Welsh Natural History Museum at Cardiff a collection of botanical studies from his own brush. Last year he published a little book setting forth the main lines on which medicine had progressed during his life time, a book calculated to revive the failing heart of pessimists who see only the fields untilled in medicine. A year ago he received the hon. M.Sc. from the University of Wales. Dr. Drinkwater was twice married and is survived by three children of the first marriage and by his second wife, whose is a medical graduate of London University.

WILLIAM MONTAGU VENABLES WILLIAMS,
L.R.C.P. EDIN., D.P.H.

Dr. Venables Williams, who died on July 13th at Colwyn Bay in his sixty-eighth year, was one of the most respected and, until his health began to fail, one of the busiest practitioners in North Wales. He was the only surviving son of the late Rev. W. Venables Williams, formerly vicar of Llandrillo, and one of the founders of Colwyn Bay as a health resort. He studied at the Liverpool School of Medicine and at Edinburgh, qualifying L.R.C.P. & S. Edin. in 1882, and after middle life qualified for the post of medical officer of health by obtaining the D.P.H. He remained until his death health officer to the urban district of Colwyn Bay and honorary physician to the Colwyn Bay Cottage Hospital. He is survived by his widow.

THE LATE DR. HAROLD CLIFFORD.

We briefly announced in our issue of July 18th the death of Dr. Harold Clifford at Manchester. Dr. Archibald Donald writes: "His death came as a shock to his friends. His health had not been good for some three or four years, but there had been nothing definite apart from a sudden loss of vision in April last due to intracranial hæmorrhage. But his eyesight had improved and he was in good spirits again. On July 5th he was ill with what appeared to be a gastric disturbance, and he died on July 7th from a severe cerebral hæmorrhage. You have already mentioned some of the many important posts which Dr. Clifford held in Manchester. He was a member of the North of England Obstetrical and Gynæcological Society for many years, and held the office of President in 1922. He was widely known as a wise adviser and a skilful surgeon in his own department and had a large practice.

"Dr. Clifford was handicapped for the struggle of life by ill-health. He gave an example of what could be accomplished by a courageous and resolute

spirit in a frail body. He was never fitted for any form of severe physical exercise, and the recreation of outdoor games or any kind of sport was barred to him. As it was he found his pleasure in his work during the day, and in reading and in the society of his friends in the evening. He was an excellent host and seemed to be happiest when he was entertaining a small circle of friends. His manner was quiet, and although he held so many important appointments and had attained to a position of distinction in his special department, he preferred to remain in the background himself. He will be missed by a large circle of friends and perhaps most of all by his colleagues."

EVAN EVANS, M.B. CAMB., F.R.C.S. ENG.,
SURGEON LIEUTENANT-COLONEL.

THE death has occurred at Bury Port of Dr. Evan Evans in his seventy-second year. Studying at Cambridge and St. Mary's Hospital, he graduated as B.A. in 1882 and as M.B., Ch.B. in 1886. He became demonstrator in physiology and pathology at St. Mary's Hospital and clinical assistant in the ophthalmic department there and also at the Royal London Ophthalmic Hospital. In 1888 he took his D.P.H. and in 1894 became F.R.C.S. Eng. Dr. Evans settled in Llanelly, where for over 30 years he has been medical officer of health for Llanelly rural district. He was Surgeon Lieut.-Colonel of the 4th Batt. Welsh Regt. (T.F.) and an ex-President of the South Wales and Monmouth branch division of the B.M.A.

MARY EVA HASTINGS MORRIS, M.D. LOND.

AFTER a prolonged illness Dr. M. E. H. Morris died on July 11th at Bath, where she had been in practice for several years and where she had gained a large circle of friends. After studying at the London School of Medicine for Women she took the M.B. degree in 1902 and the M.D. in 1913. Before settling in Bath Dr. Morris was house surgeon in the North Devon Infirmary and physician to out-patients in the Bristol Royal Hospital for Sick Children and Women. In Bath she was school medical officer from 1908 to 1917, and she acted as assistant pathologist in the Bath War Hospital. There was a large congregation at the funeral service in Bath Abbey on July 15th, and on the following day the interment took place at Ystradmeury, Cardiganshire.

RICHARD HENRY GRIFFITH, L.R.C.P. EDIN.

THE death took place at his home in Nevin, Carnarvonshire, of Dr. Richard H. Griffith on July 13th at the age of 61. He was taken ill on the Saturday previous when playing golf. Well known in athletic circles in North Wales, he was an ex-captain of Nevin and Abersoch Golf Clubs. An experienced yachtsman, he often acted as commodore at the annual regattas in South Carnarvonshire. After studying at University College, London, he qualified L.R.C.P. and L.R.C.S. Edin. in 1892, having been a house physician in the skin department in University College Hospital, London. Besides having a large practice, he was medical officer of health for the Pwllheli union. Dr. Griffith leaves a widow and one daughter.

WORK OF PENSIONS MINISTRY.—Major G. C. Tryon, Minister of Pensions, opening the new Ministry of Pensions Hospital in Mossley Hill, Liverpool, on July 14th, said that since the Ministry was started in 1917 it had spent in its efforts to alleviate suffering a sum which, including the present year, would have paid off the whole of the National Debt before the war. This year it was spending £66,000,000. At the height of this work in 1920 they were providing treatment, or arranging for it through the civil hospitals, for 150,000 men. Up to the present time, not counting allowances, £39,000,000 had been spent on actual treatment of the sick and wounded, and among the men who had passed through the hospitals were 39,000 who had lost limbs. The number now receiving treatment of various kinds was 40,000. The new hospital at Liverpool is part of a scheme for the reduction and centralisation of Ministry of Pensions medical institutions.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. E. R. Townsend is placed on the Retd. List with rank of Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lieut. (D.) A. G. D. Pridham to be Surg. Lt.-Comdr. (D.).

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. C. G. Thomson retires on ret'd. pay on account of ill-health.

Maj. A. C. Vidal, half-pay list, late R.A.M.C., retires on ret'd. pay on account of ill-health.

Capt. J. Vallance retires, receiving a gratuity, and is granted the rank of Maj.

ARMY DENTAL CORPS.

Temp. Capt. E. H. C. Cauter, from Gen. List, to be Capt.

TERRITORIAL ARMY.

Maj. A. Topping (late R.A.M.C.) to be Capt. and to relinquish the rank of Maj.

Capt. G. J. Linklater, from General Hospital List, to be Capt.

Capt. G. D. Yates, R.A.M.C., to be Divisional Adj't. 52nd (Lowland) Div., R.A.M.C., T.A., and School of Instruction, vice Capt. R. C. Aitchison, R.A.M.C.

Supernumery for Service with the O.T.C.—University of Lond. Contgt., Sen. Div.: Capt. H. H. Woollard to be Maj. (Prov.).

The King has conferred the Territorial Decoration upon Lt.-Col. (Bt.-Col.) G. C. E. Simpson and Maj. A. A. Hingston and S. F. Linton.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. (Bt.-Col.) W. Bowater, from Active List, to be Lt.-Col. (Bt.-Col.).

Maj. E. J. Boome, from Active List, to be Maj.

ROYAL AIR FORCE.

Flight Lt. E. N. H. Gray is promoted to the rank of Squadron-Leader.

Flying Officer G. Clark is transferred to the Reserve, Class D.2.

DEATHS IN THE SERVICES.

Sir W. Launcelotte Gubbins, K.C.B., M.V.O., K.H.S., formerly Director-General A.M.S., who died recently, at the age of 75, from the effects of a cycling accident, was the son of the Rev. George Gubbins, Prebendary and Chancellor of Limerick. He graduated in arts and medicine at Trinity College, Dublin, in 1872, after passing a brilliant undergraduate degree, being Erasmus Smith scholar. In 1873 he was gazetted as a surgeon in the army, and obtained his first experience in the field under the late Lord Roberts during the Afghan campaign of 1878. He was in medical charge of the 1st Battalion 5th Fusiliers in the operations in the Bazar Valley, and later became medical officer to Lt.-Gen. Sir Francis Maude, V.C., and saw much of the fighting in the Khyber Pass. Later he became divisional sanitary officer and secretary to the P.M.O. While still a junior in rank he was posted to Lord Wolseley's forces in Egypt during the suppression of the 1882 revolt, and after his promotion to Surgeon-Major in 1885 was sent out to India under Lord Roberts in the Burmese campaign. In 1894 he became Assistant Director at the War Office, his term of office embracing the period when the old Army Service became a Royal Corps, and he did much to develop the movement for voluntary aid in connexion with the Red Cross as a member of Lord Wantage's Committee. In 1899 he again served under Lord Roberts as P.M.O. to the 6th Division in the South African War with the local rank of Colonel, was at the relief of Kimberley, at Paardeberg, and entered Bloemfontein. Later he was in the Orange River Colony and the Transvaal, and was P.M.O. at Pretoria, Pietersburg, and on the northern line of communication. He received the commendation of Lord Kitchener as a capable administrator, who had accomplished much in the battle with enteric. On his return home he became P.M.O. on the Home District staff and was appointed to the Duke of Connaught's staff for the coronation of King Edward. The successful medical arrangements for the ceremony gained him the M.V.O., and soon afterwards he was promoted to Surgeon-General. Returning to India he became successively P.M.O. in Bombay and in the Eastern Command and chief of the Medical Division in India. In 1908 he returned to England, acted as Deputy Director-General,

and two years later was made honorary surgeon to the King and succeeded Sir Alfred Keogh as Director-General of the Army Medical Service. During his term of office he greatly improved the physical standard of the army, and by the introduction of salvarsan much reduced the period of treatment in military hospitals of cases of syphilis. During the late war he was temporarily employed in various posts and keenly interested himself in the work of the British Red Cross Society, receiving for his services the reward for distinguished and meritorious service.

Medical News.

UNIVERSITY OF LONDON.—The Committee of the Medical Members of the Senate have elected Sir Wilmot P. Herringham, K.C.M.G., C.B., M.D., F.R.C.P., to be their chairman for the year 1925–26.

Reader in Protozoology.—The title of Reader in Medical Protozoology in the University has been conferred on Mr. J. G. Thomson, M.A., M.B., Ch.B. Edin., in respect of the post held by him at the London School of Hygiene and Tropical Medicine. He was educated at the University of Edinburgh and has been lecturer in protozoology at the London School of Tropical Medicine since 1914.

In the recent examinations the following candidates satisfied the examiners:—

M.D. EXAMINATION.

Branch I., Medicine.—Percy C. Brett, St. Thomas's Hosp.; Gertrude B. G. Carden, London Sch. of Med. for Women; Edward Gallop, St. Bart's Hosp.; Paul C. Gibson, London Hosp.; Charles F. Harris, St. Bart's Hosp.; James L. Livingstone, King's Coll. Hosp.; William E. Lloyd (University Medal), St. Bart's Hosp. and Westminster Hosp.; Wilfrid P. H. Sheldon, King's Coll. Hosp.; John S. Sloper, St. Thomas's Hosp.; Richard H. Wade, St. Bart's Hosp.; and Samson Wright, Middlesex Hosp.

Branch III., Psychological Medicine.—Elizabeth C. Eaves, University of Sheffield and King's Coll. Hosp.

Branch IV., Midwifery and Diseases of Women.—Michael W. B. Bulman, London Hosp.; Macormack C. F. Easmon, St. Mary's Hosp.; and Winifred M. Gray, Hilda T. Haggett, Phoebe M. Phillips, and Elaine M. K. Salmond, London Sch. of Med. for Women.

Branch V., State Medicine.—Eleanor M. Reece, London Sch. of Med. for Women and Univ. Coll.

Branch VI., Tropical Medicine.—Khorshed S. Captain, London Sch. of Med. for Women and London Sch. of Tropical Med.; Henry C. V. Joy, London Hospital and London Sch. of Tropical Med.; Una F. M. Morton, London Sch. of Tropical Med. and Univ. Coll. Hosp.

M.S. EXAMINATION.

Branch I., Surgery.—Thomas G. D. Bonar, Guy's Hosp.; and John P. Hosford (University Medal), St. Bart's Hosp.

The following awards have been made in the Faculty of Medical Sciences at University College:—Cluff Memorial Prize (for proficiency in anatomy, physiology, pharmacology, and chemistry): R. M. Sargent. Anatomy: Gold Medal (Senior Class); Mary E. Sharp. Histology and Embryology: Prize equivalent to Silver Medal; Audrey Z. Baker and Margaret D. Wright (equal). Organic and Applied Chemistry: Silver Medal (General Course); D. F. Ogborn. Physiology: Gold Medal (Senior Class); J. R. Pierre. Pharmacology: Silver Medal (General Course); H. E. James.

UNIVERSITY OF EDINBURGH.—At the graduation ceremony held on July 24th the following degrees were conferred:—

DOCTOR OF MEDICINE.

Philip Barlow, *Ernest Bulmer, Sisir Chandra Chatterjee, †Leybourne S. P. Davidson (in absentia), Harold B. Dykes, Richard N. Gibson, David Landsborough, †Joseph C. Lorraine, †Kenneth A. T. Martin, †Solomon J. Rom, Sydney W. Smith, †Sahib Singh Sokhey (in absentia), May D. Stranger, †Brian G. Thompson (in absentia), †Thomas R. R. Todd, †Arthur R. Wightman, †Norman B. Williamson, and †Hedley D. Wright.

* Highly commended for thesis. † Awarded gold medal for thesis. ‡ Commended for thesis.

MASTER OF SURGERY.

Thomas B. Mouat.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

George L. Alexander, Christina W. Alston, Frank S. Anderson, George M. Anderson, Matthew D. S. Armour, Frank Ayrey, Ethel W. Barnley, John M. Bassett, David Bell, Heilet F. Bezuidenhout, James G. Bogle, Eleanor B. Bone, George I. Boyd, George G. Brander, Thomas Brewis, Anna M. Brown, James Brown, John S. Brown, William M. Brown, Joseph Bryant, Hsing Chang, James L. Chisholm, Ronald V. Christie, Robert Clark, *William J. A. Coldstream, Edwin G. Collins, John B. Colquhoun, John Comrie, Robert C. Craig, †Sidney

E. Croskery, John M. Davidson, Henry N. Davies, Eric F. Dott, Mary L. Drabble, George H. Duncan, Milad Luka El-Zik, Edgar L. Farrow, Jacobus C. Faure, Edward K. A. Firth, Charlotte E. Fisher, Charles G. Fletcher, Mary H. S. Forrest, Duncan H. Fraser, George Fraser, John A. Fullerton, Andrew N. Gardner, Margaret S. Gibb, Aubrey A. Gibbons, Alexander MacA. Gillespie, Silvio C. Gomes, Coleridge G. Gooding, Frank N. Grannum, Jessie Griffin, William Happer, Louisa B. Harper, John S. Hendrie, Edward J. C. Hewitt, John F. Hinksman, John C. Hodgson, John E. Howell, Laurence J. Howie (in absentia), Charles L. Hutson, Archibald M. de la Mazière Jamieson, Eric B. Jones, Marjory J. D. Kelly, Morris Kelman, Betty M. Kennedy, Frederick G. Kerr, John B. King, †John G. Kininmonth, Harold S. Kissensky, William E. Knowles, Donald P. Lambert, Robert Lees, William M. Lloyd, William G. Love, *John G. M'Crie, Ogilvy J. S. Macdonald, William F. Macdonald, Duncan M'Eachran, John T. M'Glasson, Victor J. G. Macgregor, Bell C. Mackay, James Mackay, Margaret S. Mackay, Mary E. M'Laren, Christina J. M'Leay, Alastair Macleod, Annie E. M'Leod, Isabella Macleod, John Macleod, Duncan Macmillan, Frank G. Macnair, Ian G. Macpherson, Sheila Macpherson, Malcolm D. Macqueen, Hugh M'Vicker, Elizabeth P. M'Whirter, †Donald Mainland, William Marshall, William R. Martine, David E. C. Mekie, Ivor B. L. Menzies, De la Rey van der Merwe, Arthur L. Millar, Margaret M'D. Miller, Alexander J. Milner, Charles E. Mitchell, Kenneth T. Moir, William A. Morrison, John Morton, Hendrik van Reenen Mostert, William T. F. Muir, David A. Murray, Stanley J. G. Nairn, Susan G. Narunsky, Beatrice M. Nicholson, Elizabeth H. Nimmo, George W. M. Paterson, Patrick W. R. Petrie, *Hilta Inès Christina Pfister, Charles H. Piper, Andrew M. Porteous, Steven T. Pottinger, John Prentice, Alexander A. M'K. Reekie, †Alexander H. Rintoul, Alison Ritchie, Charles W. Robertson, Edith A. Robertson, Dora F. M. Rose, Maurice Rosenberg, Andrew C. Ross, Isabella M. Ross, Jean A. Ross, Margaret Round, Alexander W. Sanderson, Robert H. Sanderson, Alfred E. M. Sandison, Sophie Sash, John B. de Cusance M. Sanders, Hyman F. Schiller, Gordon I. Scott, William F. Scott, Henry Selesnick, William V. Semple, Chrissie Short, Alfred J. Skinn, William B. Smellie, Alistair H. Smith, Dorothy Smith, Robert W. Smith, Thomas H. Stephens, Robert Strang, George M. Sturrock, James S. Sutherland, Jean Sutherland, Vigrow W. Sutherland, Dorothy M. Taylor, Arthur Teasdale, Donald W. Thompson, John Thomson, Irene M. H. Tincker, Norman S. Turnbull, Alec B. Walker, Alexandra A. Warnock, Alfred O. Watkins, John M. Watt, Dorothy Watterson, Barclay P. Webster, Lucien B. Wevill, John White, Janet Wilson, and Ai Sung Wong.

* First-class honours. † Second-class honours.

The following awards have been made: Cameron Prize in Practical Therapeutics: Dr. R. Magnus, Professor of Pharmacology, University of Utrecht. Goodsir Memorial Fellowship: Adam D. Macdonald. Gunning Victoria Jubilee Prize in Physiology: William G. Millar. Gunning Victoria Jubilee Prize in Surgery: Harold K. Corkill. Chiene Medal and Prize in Surgery: Thomas B. Mouat. Ettles Scholarship and Leslie Gold Medal: William J. A. Coldstream. Allan Fellowship in Clinical Medicine and Clinical Surgery: John G. Kininmonth. Murchison Memorial Scholarship in Clinical Medicine: Sidney E. Croskery. M'Cosh Graduates and Medical Bursaries: Hilta Inès Christina Pfister. Mouat Scholarship in the Practice of Physic: William J. A. Coldstream. Buchanan Scholarship in Gynaecology: Robert W. Smith. James Scott Scholarship in Midwifery: John G. M'Crie. Lauder Brunton Prize in Pharmacology and Therapeutics: Andrew R. Gilchrist. Beaney Prize in Anatomy and Surgery: John G. Kininmonth. Conan Doyle Prize: Hyman Felix Schiller. Annandale Gold Medal in Clinical Surgery: William J. A. Coldstream. Scottish Association for Medical Education of Women Prize: Hilta Inès Christina Pfister. Dorothy Gillilan Memorial Prize: Hilta Inès Christina Pfister. Sir Robert Jones Prize in Orthopaedic Surgery: Alexander W. Sanderson. Pattison Prize in Clinical Surgery: John Thomson. Wellcome Medals and Prizes in the History of Medicine: Gold Medal, Alexander Haddow; Silver Medal, Bryan Williams. Cunningham Memorial Medal and Prize in Anatomy: George I. H. Braine. Whiteside Bruce Bursary: Thomas P. Bliss.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—

At a meeting of the College held on July 21st, Sir Harold J. Stiles, President, in the chair, the 28 successful candidates out of 58 entered, who passed the requisite examinations between March 30th and April 6th, were admitted Fellows:—

George J. Alexander, Leslie C. L. Averill, George H. Buckley, John A. G. Burton, Ernest Y. Camrie, Leopold R. de Castro, William A. Ekanayake, Doris C. Gordon, William P. P. Gordon, Reginald D. McK. Hall, Robert B. Hare, Charles F. W. Illingworth, Noel Kemm, Noel Kretzmar, Ramkrishn Harbhagwandas Lula, Claude H. Marshall, Finlay S. Mayne, Donald S. Middleton, Oswald O. Popper, Frank N. Reynolds, Edward H. Richards, Donald E. Ross, Cyril R. Sandiford, Robert Selby, John McD. S. Slater, Jacob W. van Reenen, Stewart A. Wallace, and William H. O. Woods.

The following candidates, having passed the Final Professional Dental Examination, have been granted the diploma of L.D.S. R.C.S. Edin.:—

Guthrie Russell, Douglas Sutherland, John Balfour, Albert G. Ueckermann, Esme K. Wilson, Lewis W. G. Watson, Alastair G. Couston, John J. Seaton, William Mason, Margaret I. MacTaggart, and Mela Ram Soni.

SCHOOL FOR PRE-TUBERCULOUS CHILDREN.—At the annual meeting of the Liverpool Hospital for Consumption on July 22nd it was decided to provide and maintain an open-air school and hospital for pre-tuberculous children. This will be the first of its kind in the north of England.

HARROGATE ROYAL BATH HOSPITAL.—On Monday, August 10th, Princess Mary, Viscountess Lascelles, will open the new bacteriological and biochemical department at this hospital. The Earl of Harewood, G.C.V.O., will preside.

FINANCE OF THE GENERAL NURSING COUNCIL.—The income of the General Nursing Council for the year ending March 31st last was £27,505, and the expenditure £20,042. Examination fees produced the large sum of £12,301; the fees paid to examiners amounted to £4580. The Council has £20,000 invested and a further £5000 in the bank.

REGISTERED NURSES.—The new Register of Nurses contains 42,173 names, but recent additions have brought up the number to over 47,000. Some thousands of applications for registration received during the closing days of the period of grace have yet to be dealt with, and when they have been disposed of the total number of State-registered nurses will probably exceed 50,000. In future registration will be by examination.

CANCER RESEARCH IN YORKSHIRE.—It has been decided by the Yorkshire Council of the British Empire Cancer Campaign to appeal to the county for £75,000 for research work. Most of this work will have to be conducted at the Medical School of Leeds University, but Sir Berkeley Moynihan points out that the school has "no proper habitation" and that its equipment is inadequate.

MEDAL AWARDED TO BLOOD DONOR.—The Minister of Health on July 27th presented the Meritorious Service Medal of the Order of the British Empire to Mr. Bertie Wallace Tibble in recognition of his public-spirited work as a blood donor to the London Hospital. Mr. Tibble has given a pint of blood on more than 50 occasions, and although of small means has always refused the usual payment of 5 guineas for his service.

DUBLIN HOSPITALS.—In a speech at the Dublin Rotary Club, Sir W. de Courcy Wheeler declared that there are far too many hospitals in that city and that some of them are totally out of date. They lack lifts and patients have to be carried from the operating theatre along corridors and up staircases. Sir William Wheeler suggested that four or five of the hospitals might well be amalgamated, and laid especial stress upon the desirability of children being dealt with outside the city.

BAN ON UNVACCINATED SEAMEN BY U.S.A.—On July 14th a test case of importance to shipowners and seamen was heard at Liverpool City police-court, when a ship's fireman claimed for arrears of wages. It appears that when the ship arrived at Vancouver the crew were informed of a new American regulation that no ship could be allowed to enter the port unless the master could produce a certificate from the American consul in the last port of call saying that all the crew had been vaccinated during the last 12 months. Three firemen, including the plaintiff, stated that they had never been vaccinated and had conscientious objections to vaccination. They were left behind in Vancouver and the ship returned after a voyage to the United States and picked up the three again at Vancouver. After arguments by counsel, the magistrates decided that the men were merely put ashore, that the men had not signed off, and found for the sum claimed. The importance of the case lies in this new drastic protective regulation by the United States Government.

FIRST INTERNATIONAL MALARIA CONGRESS.—This Congress will be held at Rome under the patronage of the Italian Government on Oct. 4th, 5th, and 6th. Amongst others, the following subjects will be discussed: (1) Anopheles and malaria, (2) biology of the parasites (unicity and plurality of the parasites), (3) the alkaloids of quinine and the therapy of malaria, (4) epidemiological factors and antimalarial measures, (5) propaganda (statistics), (6) inoculation fever. All medical men will be admitted to the Congress, and the official languages will be English, French, German, Italian, and Spanish. All communications to the Congress should be sent to the secretary not later than Sept. 20th, and manuscripts or communications for distribution should arrive before Sept. 1st. Hotel accommodation will be provided by the Executive Committee of the Touring Agency, Ente Nazionale Industrie Turistiche, of Piazza Colonna, Rome, who will also supply any information useful to

travellers. Applications for accommodation should be received by the secretaries of the Congress at 14, Via XXIV. Maggio, before Sept. 20th. A fee of Lir.100 will be charged for each member of the Congress.

UNIVERSITY OF PARIS.—A vacation revision course will be held at the Hôtel-Dieu from Sept. 14th to 25th. The subject will be Recent Medical and Surgical Views on Diseases of the Digestive Tract, fully illustrated by demonstrations of all kinds. Following the course there will be a study tour to Vichy. Further particulars may be obtained from the Clinique Médicale de l'Hôtel-Dieu, Paris.

BIRTH CONTROL CLINIC.—The original clinic for constructive birth control, founded by Dr. Marie Stopes and Mr. H. V. Roe at Holloway, has removed to more central quarters at 108, Whitfield-street, Tottenham Court-road, W.1. Nurse N. Jones, who gained the C.B.C. certificate after training at this clinic has been put in charge of the birth control clinic recently opened by the Abertillery and District Hospital.

GUY'S HOSPITAL: A YEAR'S WORK.—The report of Guy's Hospital for 1924, which has just been issued, shows that during the year 9495 patients passed through its 616 beds, as compared with 8765 in 1921, yet the average number of days' residence (21.25) remained practically constant. It is claimed that this is "the result of careful organisation in reducing to a minimum the number of vacant beds." Adding the number of patients in the hospital at the beginning of the year, the total number who received treatment in the wards was 10,017, the largest ever recorded in 12 months. The out-patients numbered 124,000, and in this department a whole-time clinic for the treatment of venereal diseases has been opened. Between 1923 and 1924 the number of attendances for massage increased from 26,791 to 31,106; for remedial exercises the growth was even more remarkable—namely, from 4443 to 14,013. With a total expenditure of £158,000, the deficiency on income and expenditure account was less than £2000, thanks to a large increase in legacies. At the end of the year there were 267 nurses in training.

DONATIONS AND BEQUESTS.—By the will of the late Sir Rickman Godlee, the testator left, on his wife's decease, among other bequests, £5000 to the Royal Medical Benevolent Fund; £5000 (to include the amount of his debentures in that Society) to the Royal Society of Medicine, to be applied as far as possible for the purposes of the library of the Society; £10,000 upon trust for investment, and to apply the income in travelling scholarships for students of University College Hospital Medical School who had held a house surgery and one other resident appointment at University College Hospital, and are, in the opinion of the committee, likely to benefit from visiting medical schools and scientific institutions abroad or in this country. If, in the opinion of the committee, there should be a more suitable form of post-graduate study the scholarships may be applied for this purpose, in the discretion of the committee. He stipulated that in the event of the hospital being taken over or maintained by the State or municipality or other public authority this trust should continue as a permanent fund to benefit students in the way indicated and not be merged in some general "educational trust." He also left £1000 to the Whitechurch District Nursing Association, offered as an endowment.—The late Mr. William Henry Armitage, of Buxton, left £1500 to the Manchester Children's Hospital, Pendlebury, for a cot; £1500 to the Salford Royal Hospital for a cot; £1000 each to the Manchester Royal Infirmary, Ancoats Hospital, St. Mary's Hospital, Manchester, and the Manchester and Salford Blind Aid Society; £500 each to the Manchester Ear Hospital, the Manchester Royal Eye Hospital, and the Manchester and Salford Hospital for Skin Diseases; £300 each to the Manchester and Salford Sick Poor and Private Nursing Institution, the Manchester City League of Help, and the Salford Civic League of Help; £200 to the Society for the Prevention of Cruelty to Children; £200 to the Boys' and Girls' Refuges, Strangeways; £100 to the Salford Lads' Club; and £100 to the Cinderella Club, Withy Grove.—As a result of the wireless concert organised by the Daily Graphic and Allied Newspapers, Ltd., £3853 will go to funds of the Infants Hospital, Westminster.—Alderman E. Dickinson, J.P., Wigan, left £250 to the Royal Albert Edward Infirmary, Wigan, to be invested for the annual provision of Christmas gifts for the children's in-patient department, and £1000 for the endowment of a bed.—During the year for the Hospital Sunday and Saturday Fund, Carlisle, £3200 was collected and distributed as follows: Cumberland Infirmary £2333, Carlisle Dispensary £242, Silloth Institute £485, Carlisle Fever Hospital £50, Carlisle Nursing Association £60.—Legacies of £1347 from the executors of the late Mr. Joseph Bell and £450 from the late Mr. Joseph Milnthorpe have been received by the Manchester Royal Infirmary.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, JULY 23RD.

The Public Health Bill.

THE House went into Committee on the Public Health Bill (a measure which consolidates a number of provisions contained in private Acts and makes them applicable to the country generally). The EARL of DONOUGHMORE was in the chair.

Lord BANBURY of SOUTHAM moved to leave out Clause 62, which provides for the removal to hospital of infectious persons suffering from pulmonary tuberculosis at the instance of the county council or the local authority in cases where the lodging or accommodation occupied by the patient is such that proper precautions to prevent the spread of infection cannot be taken or are not being taken. He said that the clause seemed to be likely to give rise to very considerable expense, to interfere with the existing hospitals, and to be of the nature of "grandmotherly" legislation. Apparently everybody who was in ill-health was now to be provided for by the State or by the rate-payers.

Lord EMMOTT (who was in charge of the Bill) said that he thought the clause was a very valuable one. It was not for the purpose of spending money, but for the purpose of taking steps where necessary to protect the public from infection. Pulmonary consumption was a highly infectious disease, and if the local authorities had not power to deal with it, it was possible for it to spread very considerably. There were great safeguards in the clause. First, its application was limited to patients whose surroundings prevented the adoption of proper precautions, and in any event it must be shown that serious risk of infection arose. In the second place there was a requirement that the receiving institution should have consented to the reception of the patient, and that suitable accommodation existed. In the third place there was a requirement that the cost of removal to, and maintenance in, the hospital should be borne by the county council or local authority. At any rate, that removed injustice from the individual. In the fourth place the period of detention was limited, and in the fifth case an application could be made on behalf of the patient to the court for the rescission of the order at any time after six weeks from the date of the order.

The amendment was negatived.

On Clause 63, which deals with the extended use of ambulances, and allows people leaving hospital, not having suffered from any infectious disease, to be put into vehicles which have previously carried cases of infectious disease, provided that suitable precautions are taken to prevent the communication to any person of infectious disease,

Lord DYNEVOR moved an amendment providing that on each occasion a certificate should be signed by a registered medical practitioner, so that it might be quite certain that proper precautions were taken against the spread of disease.

Lord EMMOTT, in resisting the amendment, said that it would cause great delay and considerable expense and he did not think that it would add at all to the safety of the public and of the patients.

Lord DYNEVOR said that if the noble lord was quite certain that no infection would be spread he would not press the amendment.

The amendment was withdrawn.

On Clause 64, which gives a local authority power to make reasonable subscriptions or donations to a voluntary hospital or institution, if it is satisfied that by so doing it will maintain, or extend, or increase the efficiency of hospital accommodation for the sick inhabitants of the district,

Lord BANBURY moved to delete the clause on the ground that it opened up a great vista of expense to the rate-payers. It would militate, he said, against the public subscribing to the voluntary hospitals. It was an attempt to provide State hospitals, which he thought was wrong.

Lord EMMOTT said he thought that it was possible that the clause would be a saving rather than a spending one. There were many cases in which hospitals found it extraordinarily difficult to live, and just a little bit of help from the local authority might enable them to keep going. It would not cause the hospitals to become public institutions more than they were to-day.

The EARL of MALMESBURY thought that it was the thin end of the wedge against the voluntary system if they introduced grants from public authorities.

The LORD CHANCELLOR (Viscount CAVE) said that no one would be more unwilling than he that the hospitals should cease to be voluntary, and come upon the rates. But for all that he was strongly in favour of this clause. He did not think that it would in the least endanger the voluntary character of those institutions. The local authorities who employed large numbers of workmen owed a great debt to local hospitals.

Lord STUART of WORTLEY said he knew a town in which a contribution of a penny in the pound on wages by employers, as well as by the employees, had produced a sum which had placed the hospitals out of the reach of serious financial necessity. Could anyone say that in that case the local authority as a large employer of labour should not contribute its small quota to that desirable result? It was possible that the clause might be amended so as to limit it to contributions in respect of a municipality's own employees.

Lord EMMOTT said that there had always been some doubt in carrying out Section 131 of the Public Health Act, 1875, as to whether it did not contemplate that special accommodation should be provided at the hospital for the subscription paid, and whether subscriptions by the local authority in response to appeals from the hospital were authorised. It was to remove that doubt that the clause had been inserted in the Bill. There were already many such provisions in local Acts.

Lord BANBURY said he had no objection to the amendment proposed by Lord STUART of WORTLEY. If the noble lord would draft an amendment on the lines suggested and consult him afterwards he would withdraw his own amendment now with a view to another amendment being moved on the report stage.

The amendment was withdrawn.

The Committee stage of the Bill was concluded and the Bill was reported to the House.

Summer-Time Bill.

On the motion of Lord DESBOROUGH the Summer-Time Bill, which has already passed through the House of Commons, was read a second time.

TUESDAY, JULY 28TH.

Dangerous Drugs Bill.

Viscount CECIL of CHELWOOD (Chancellor of the Duchy of Lancaster), in moving the second reading of the Dangerous Drugs Bill, which amends the Dangerous Drugs Acts of 1920 and 1923, so far as is necessary to enable effect to be given to the Opium Convention, signed at Geneva on Feb. 19th last, said that the measure was not a contentious one, and was necessary because the Convention could not be ratified without some slight changes in our law. It was very important that the Bill should be passed before Parliament adjourned in August, because the Government were very anxious to ratify the Convention at the earliest possible moment. The first clause of the Bill extended the Dangerous Drugs Acts of 1920 to coca leaves and Indian hemp. The second clause made a small change in the machinery of The Hague Convention, under which these things had hitherto been governed. The third clause brought up to date, in accordance with scientific opinion, the definition of certain alkaloids, such as morphine, heroin, ecgonine, and things of that kind, which had been more carefully defined by the assistance of the experts at Geneva. Clause 5 gave power to strike out from the list of dangerous drugs those drugs which, by experience, had been found not to be capable of being used by addicts, and were therefore no longer to be classed as dangerous.

The Convention represented a very valuable advance in the struggle to bring under control the use of these drugs, and primarily the drugs and substances referred to in the Convention. There were three broad divisions of the subject dealt with by the Convention. There was raw opium, which was used for eating in India, which really was not an international question at all. It was concerned only with what the Indian Government allowed its Indian subjects to do with the opium grown in India. Then there was opium smoking which, apart from a few relatively unimportant exceptions, was a purely Chinese question. Practically it was only the Chinese who indulged to any extent in opium smoking. The large growth of opium in China and the unhappy condition of that country at the present time rendered it impossible to control in any way the illegitimate export of the drug.

By far the most important subject dealt with by this Convention was the question of the use of these very formidable drugs—heroin, morphine, cocaine, and the like. It was a very serious evil even for this country, and still more serious for other countries, in some of which those who trafficked in these drugs had even pushed their per-

nicious wares in the schools, thus leading children into vice. The evil was rendered all the more formidable by the fact that behind the traffic there were apparently syndicates with very considerable financial resources. He was glad to be able to assure their lordships that owing to the efforts of the Home Office the evil was not a growing one in this country, but was to a very large extent under control here. There was no doubt that international control of the traffic in these drugs would make it very much less easy for people dealing in them to find means of pushing their pernicious wares. The main purpose of the greater part of the provisions of these conventions was to institute international supervision and control of the traffic in these drugs. It was not so hopeless or so difficult a matter as one might assume at first sight, because the drugs were only manufactured in a very small number of factories—he thought there were not more than ten—and if proper national control could be obtained over these factories and international control over the traffic from them they might hope to assist in diminishing the trade. He would like to pay a tribute to the great services of the gentleman who preceded him as the representative of this country in these conferences and who had done more, perhaps, than any living man to carry forward the struggle against the illegitimate use of drugs. He referred to that exceedingly able member of the staff of the Home Office, Sir Malcolm Deleveigne.

Viscount HALDANE supported the Bill.

The Bill was read a second time.

Therapeutic Substances Bill.

The Commons' amendments to the Therapeutic Substances Bill were considered, and on the motion of Viscount GAGE all the amendments were agreed to, except in respect of a slight modification to that which provided that a regulation should be modified or annulled following the voting of an address by either House of Parliament.

HOUSE OF COMMONS.

WEDNESDAY, JULY 22ND.

Death-rates among Commercial Clerks.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Health whether, in view of the heavy death- and tuberculosis-rate among commercial clerks, owing to the insanitary, overcrowded, and badly lighted condition of the offices in which they worked, he would introduce legislation to give local authorities further powers to secure the better regulation of such offices.—Sir KINGSLEY WOOD replied: Other circumstances besides the condition of offices go to account for the present death- and tuberculosis-rates among commercial clerks. Local authorities already have certain powers to deal with conditions in offices, and my right hon. friend cannot at the present time promise further legislation.

Protection of Civilians against Poison Gas.

Mr. CECIL WILSON asked the Secretary of State for War whether he was aware that in many countries scientific investigation was taking place regarding the most deadly forms of poison gas and other inventions designed to exterminate human life; whether any steps were now being taken in this country, or when would they be taken, in instructing the civil population as to any means whereby they might protect themselves; and whether he could indicate to the House what such steps were.—Sir L. WORTHINGTON-EVANS replied: The answer to the first part of the question is in the affirmative. As regards the remainder of the question, the measures to be taken for the protection of the civil population against poison gas are now being considered by the Committee on Imperial Defence.

THURSDAY, JULY 23RD.

School Medical Services.

The House went into Committee of Supply on a vote of £25,652,754 for the salaries and expenses of the Board of Education, Mr. J. HOPE in the chair.

Mr. FISHER said when he was President of the Board of Education nothing was more encouraging than the reports received from his inspectors as to the health and general well-being of the children in the elementary schools. He would like to know whether the reports which the Board now received were equally satisfactory in this respect. Although it was true that, very largely owing to the skill, energy, and devotion of the school medical services, the health of our school population had been greatly improved, nevertheless it was true that there were still great defects to be remedied. He noticed, for instance, that in the last report of the Board of Education it was stated that there were 200,000 children mentally or physically defective

who had not yet received places in special schools. Owing to the great expense of such schools he quite believed that it would be sanguine to expect this deficiency to be made up immediately, but he noted with pleasure that the President of the Board was pressing the local education authorities to do their best to make up the deficiency, and he trusted that he might receive some support from the private benefactor.

Dr. HADEN GUEST said it seemed to him that they ought, in view of the very satisfactory nature of the results which had flowed from medical inspection, to increase the amount of health work and health care of children and not diminish it. That should apply to all the schools in the country, irrespective of whether they were public schools or others. He believed that the extension of medical health work to all schools would have exceedingly valuable results. He also wished to refer to the fact that some 10 per cent. of the children attending elementary schools were never adequately fed. He should like to see the Board of Education insist on the standard of physical well-being and feeding of children being raised very considerably higher than it was at the present time. It should be the business of the medical officer and the school inspector to draw up a list of children who would benefit by increased nourishment, and it ought to be part of the school curriculum to provide school meals which could be either paid for or given free to the children who required them. That was a method of practical Communism which would commend itself to both sides of the House.

The DUCHESS of ATHOLL (Parliamentary Secretary to the Board of Education), replying to Mr. FISHER, said the last report of the chief medical officer of the Board gave some very comforting figures. In 1923 36.7 per cent. of the children in the schools inspected had defects of one kind or another compared with 44 per cent. in 1894. That was certainly progress. In the same year there were 5.9 per cent. who had been diagnosed as under-nourished as compared with 12.8 per cent. in 1913. It was found that children suffering from defective hearing were only half what they were ten years ago. The work was carried on unobtrusively and was not spectacular, but day in and day out it was going on steadily.

The vote was agreed to.

Lead Poisoning and the Pottery Industry.

Mr. CLOWES asked the Home Secretary the number of fatal cases of lead poisoning in the pottery industry last year; what were the ages of the persons who died and the nature of the process worked; and what was the length of time each of the deceased had been employed on lead processes.—Sir W. JOYNSON-HICKS replied: The following are particulars of deaths from lead poisoning in the pottery industry for the year 1924:—

Case No.	Sex.	Age.	Occupation.	Duration of employment in lead processes.
1	M.	46	Glost placer.	16 years.
2	M.	65	"	Believed many years.*
3	M.	51	"	29 years.
4	M.	51	"	36 "
5	M.	55	Dipper.	38 "
6	M.	50	Oddman.	Many years.
7	M.	59	Glost placer.	47 years.
8	M.	63	"	At least 18 years.
9	M.	44	"	Many years.
10	M.	54	"	33 years.
11	M.	53	Dipper.	25-30 years.
12	M.	46	"	20 years.
13	M.	51	"	42 "
14	M.	54	Glost placer.	36 "
15	M.	48	Dipper.	32 "
16	F.	50	Ware cleaner.	20 "
17	F.	57	"	30 "
18	F.	35	Majolica paintress.	14 "

* But has not worked since 1912 on account of lead poisoning.

Committee on Child Assault.

Lady ASTOR asked the Home Secretary whether the Committee on Child Assault had finished taking evidence; and when it was anticipated that their report would be issued.—Sir W. JOYNSON-HICKS replied: The Committee are now considering their report, and I hope it may be issued soon after the summer holidays.

Insurance Contributions in Rural Areas.

Lieut.-Colonel HENEAGE asked the Minister of Health whether, seeing that the benefits authorised under the Health Insurance Act were greater in those societies composed mostly of rural workers as compared with those in purely urban districts, and that the former societies had

created greater surpluses per person insured, he would consider authorising a reduced contribution under the National Health Insurance Act from those living in rural areas.—Mr. NEVILLE CHAMBERLAIN replied: Pending the report of the Royal Commission now in session I could not properly make such a change in the National Health Insurance system as is suggested. I may add that approved societies can repay as an additional benefit out of accrued surplus the whole or part of the contributions of their members, and accordingly societies composed mainly of rural workers and having a favourable sickness experience can now provide the normal benefits at an annual cost to members less than the product of the normal contribution.

Houses Unfit for Habitation.

Mr. TREVELYAN THOMSON asked the Minister of Health the number of houses which he estimated were not reasonably fit for human habitation in both urban and rural areas.—Mr. NEVILLE CHAMBERLAIN replied: Statistics on the point raised by the hon. Member are not available. According to the latest annual reports of medical officers of health there were 291,700 houses in urban districts and 30,954 in rural districts found on inspection not to be in all respects reasonably fit for one reason or another. During the same year defects were remedied in 12,987 houses in urban districts and 49,530 in rural districts.

Disease-carrying Mosquitoes.

Mr. FOOT MITCHELL asked the Minister of Health whether the available statistics showed any diffusion of disease-carrying by mosquitoes in this country; and whether any advice had been given to local authorities as to the desirability of eliminating likely breeding-places.—Mr. NEVILLE CHAMBERLAIN replied: I am advised that, apart from occasional casualties arising from the inflammation of mosquito bites, mosquitoes in this country are not known to carry disease other than malaria. The known cases of indigenous malaria arising in this way are very few, only four such cases have been reported during 1924.

Preservatives in Food.

Mr. SUTTON asked the Minister of Health whether independent scientific investigations had been made by his department as to the physiological effect of the use of preservatives in food; whether any and what offers had been made by manufacturers or others to combine with the department in pursuing such investigations; and whether he would arrange for inquiry to be pursued by means of independent investigation before proposing final regulations dealing with the subject.—Mr. NEVILLE CHAMBERLAIN replied: The physiological effect of the use of preservatives in food was one of the matters considered by the recent Departmental Committee on Preservatives and Colouring Matters in Food, which included a number of distinguished physiologists in no way connected with the Government or the trades concerned. I have had an offer from one large firm interested in the production of boron compounds to coöperate in a further inquiry into the effect of the consumption of small quantities of such compounds in food, but having regard to the full consideration which was given to this matter by the Committee I do not think it necessary to institute any further inquiry.

Value of Tuberculin Tests.

Mr. HURD asked the Minister of Agriculture if he was aware of the uncertainty that existed as to the value of the different tuberculin tests and the consequent discouragement of the increased production of graded milk; and whether he would issue a circular indicating what, in the opinion of the Ministry, was the best method of clearing a herd of tuberculosis and generally advising farmers in this matter.—Mr. WOOD replied: The Ministry has under consideration the investigation recently conducted under the auspices of the Medical Research Committee on the trustworthiness of various tests with tuberculin. My hon. friend will also realise that very varying conditions prevail among the herds of this country, and I am therefore doubtful whether at the present time a circular of the kind suggested would fulfil the purpose he has in view. The Ministry is always prepared to advise in cases of special difficulty.

FRIDAY, JULY 24TH.

Therapeutic Substances Bill.

The House went into Committee on the Therapeutic Substances Bill, Mr. J. F. HOPE in the chair.

On Clause 3, which deals with the restrictions on the importation of therapeutic substances.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) moved an amendment making it lawful to import any serum of foreign origin for which no standard

existed, provided that the substance complied with the general regulations governing the quality and general purity of substances of the same class. He explained that as originally drafted the clause might have prohibited the importation of such a substance as the Spahlinger serum.

Dr. SHIELDS moved an amendment to the amendment designed to allow a substance such as the Spahlinger serum to be consigned for test purposes to any medical practitioner in the country.

Sir K. WOOD said that the Government could not assent to the importation of sera without examination.

The amendment to the amendment was withdrawn and Sir K. Wood's amendment was agreed to.

On Clause 4 (which deals with joint advisory committees) an amendment was agreed to adding a member to be appointed by the British Medical Association to the advisory committee which is to assist the joint committee in framing regulations under the Bill.

On Clause 5 (which deals with the power to make regulations) Sir K. WOOD accepted an amendment moved by Captain W. BENN giving Parliament the power to move an address praying for the modification or annulment of regulations which had been laid before Parliament.

The amendment was agreed to.

The Committee stage was concluded and the Bill as amended was reported to the House.

Diseases of Animals Bill.

The House went into Committee on the Diseases of Animals Bill.

Mr. A. V. ALEXANDER moved an amendment to Clause 1 (which provides for the repayment by the Minister to local authorities of three-quarters of the amount of compensation paid by them for cattle slaughtered on account of the existence or suspected existence of tuberculosis). The amendment proposed to make this repayment dependent on the Minister being satisfied that no carcass, or portion of a carcass, had been, or would be, used for human consumption.

Mr. E. WOOD (Minister of Agriculture) said that the total condemnation of a carcass on evidence of local tuberculosis was unnecessary and wasteful. While he could not accept the amendment he would amend the Tuberculosis Order to provide that a veterinary inspector should send notice in writing to the medical officer of his intention to slaughter an animal under the Order, and that he should not remove a carcass or offal until he had received a notification from the medical officer stating whether any part of it might be disposed of for human consumption.

Dr. SHIELDS thought there should be no room for suspicion in this matter, and the procedure should be along the line of "safety first."

Sir R. LUCE said that tuberculosis was localised in a large proportion of cases and there was a very large consensus of opinion in the medical profession that there was practically no danger in the use of a large portion of the carcasses of animals affected only by a local form of the disease. The amendment would lead to wasteful action.

Dr. DAVIES said that the consensus of medical opinion was definitely against the mover of the amendment. The danger anticipated from anything circulating in the blood of these animals was very much exaggerated, and it might be absolutely ignored. There was no danger of tuberculosis being carried by the blood-stream except in the case of a cow with acute general tuberculosis, and such animals were always destroyed.

Mr. ALEXANDER said he would withdraw the amendment on the understanding that if he was dissatisfied with the actual terms of the proposed alteration in the Tuberculosis Order he could raise the point again on the third reading of the Bill.

The amendment was withdrawn. The Committee stage was concluded and the Bill was reported to the House.

MONDAY, JULY 27TH.

Spahlinger Treatment.

Mr. MACANDREW asked the Minister of Health if he was aware that the sanatorium committee for Ayrshire was unanimously of opinion that the Government should contribute towards experiments with Mr. Spahlinger's treatment of tuberculosis; and what steps he proposed to take to assist in the encouragement of experiments with this treatment.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the negative. As regards the second part, I would refer my hon. friend to the answer which I gave on the 9th inst. to the hon. Member for Bedwelty on the subject of the Spahlinger treatment.

Withholding of Addresses of Mental Patients.

Sir DAVISON DALZIEL asked the Home Secretary whether his attention had been called to the dissimilarity of decisions

regarding the alleged criminality of withholding addresses of patients escaped from mental institutions; whether he would investigate the circumstances under which a Mrs. Gibbons, of Trinity-square, Brixton, was sentenced at the Lambeth police-court to two months' imprisonment for this offence and hurriedly released from Holloway ten days later; and whether he could give the decisions in police-court proceedings of this nature in 1923, 1924, and the first six months of 1925.—Sir W. JOYNSON-HICKS replied: In Mrs. Gibbons's case I felt justified by the facts that came to my knowledge in recommending a remission of the balance of the sentence. No other case of the kind has been brought to my notice, and the Home Office have no information of other cases of the kind that may have been dealt with by courts of summary jurisdiction.

Scientific Research.

Captain MACMILLAN asked the Secretary to the Treasury whether, in arriving at the total of £4,045,000 provided in the estimates, 1925-26, for scientific research, distinction was made between research, development, and experiment; whether he would give a detailed statement showing the different items of the total mentioned; and the sum spent on scientific research carried on purely for the advancement of natural knowledge and made known through the usual scientific publications.—Mr. W. GUINNESS replied: The answer to the first part of the question is in the negative. The items collected from the several departments from which the total of £4,045,000 is made up are as follows:—

Admiralty, £983,000; War Office, £495,000; Air Ministry, £1,373,500; Ministry of Agriculture and Fisheries, £348,756; Board of Agriculture, Scotland, £51,585; Fishery Board of Scotland, £16,910; Forestry Commission, £7057; Mines Department, £1850; Department of Scientific and Industrial Research, £380,263; Scientific Investigation, £158,687; Ministry of Health, £4350; Scottish Board of Health, £100; Post Office, £52,000; Colonial Office, £15,000; Office of Works, £157,180.

These figures do not include expenditure in respect of salaries, &c., of administrative staff, except in the case of the Department of Scientific and Industrial Research.

In the case of the service departments (and to some extent of other departments also) it is impracticable to distinguish between expenditure on pure scientific research and that on technical research and experiment. The figures given include as far as possible provision of all such expenditure.

The normal work of the Government chemist entails a considerable though varying amount of research to which no definite proportion of the annual expenditure can be assigned, and nothing has been included in respect thereof in the above figures.

It is impossible to give the information asked for in the last part of the question, for the methods of pure and applied research are the same, the distinction between them being solely one of aim. All the research done by Government, the cost of which it is almost impossible to separate from that of experiment and development, is in its nature the same as that carried on purely for the advancement of natural knowledge.

Inquiry into Mental Deficiency.

Mr. HURD asked the Minister of Health what official expert investigation into the effect of mental deficiency upon the national life was now in progress; who were the investigators; and when their report might be expected.—Sir KINGSLEY WOOD replied: The Board of Control in conjunction with the Board of Education are about to undertake an inquiry into the incidence of mental deficiency; an inspector of the Board of Control has been detailed to carry out the investigation; it is estimated that the inquiry will take at least a year to complete; and it is not anticipated that any report will be available before that time.

Poison Gas in Warfare.

Colonel ENGLAND asked the Secretary of State for Foreign Affairs whether the League of Nations was considering the organisation of international action with a view to the prohibition of the use of poison gas in warfare; and, if so, what was exactly the position of such action.—Mr. A. CHAMBERLAIN replied: At the Arms Traffic Conference held at Geneva in May last, under the auspices of the League of Nations, a protocol was drawn up prohibiting the use of chemical or bacteriological methods of warfare. Twenty-five States have signed the protocol, which remains open for accession by other powers. It comes into force immediately on ratification as between those States which have ratified.

Colonial Medical Services.

The House went into Committee of Supply on a vote of £117,483 for the salaries and expenses of H.M. Secretary of State for the Colonies and H.M. Secretary of State for Dominion Affairs, Captain FITZROY in the chair.

Mr. ORMSBY-GORE (Under-Secretary for the Colonies), referring to medical research, said that nothing was more important, because it was the doctor as much as the engineer who made Panama. Further work in combating tropical diseases was most urgent. It was a fallacy to suppose that only the white man found it difficult to live in the tropics; the black man found it equally difficult. In East Africa the birth-rate was very high, but the infant mortality was appalling. So far as he could get the figures he believed that anything from 400 to 500 per 1000 of the children born in many of the native areas died within the first year. He hoped shortly to visit West Africa and to issue a report on the progress there.

The vote was agreed to.

Pharmacy in the Army.

Mr. SCRYMGEOUR asked the Secretary of State for War whether he was now prepared to publish the report presented in 1922 by the Joint Committee on the subject of pharmacy in the army; and whether the Army Council were now willing to accept the modified requirements of the Pharmaceutical Society as presented by a deputation thereof to the Director-General, Army Medical Services, at the War Office in May, 1923.—Sir L. WORTHINGTON-EVANS replied: The report of the Committee referred to was published by the Stationery Office last year in response to the wishes expressed by Members of this House. As regards the second part of the question, the Army Council are satisfied that the requirements of the army in regard to pharmacy and dispensing are adequately met under present arrangements, and they would not be justified in incurring the expense of carrying out the changes advocated by the Pharmaceutical Society.

Mr. SCRYMGEOUR asked whether, seeing that there was agreement between the Army Medical Service Department and those who represented the pharmacy interests, it was not recognised by the Department that there should be an improvement on the lines of the modified recommendations.—Sir L. WORTHINGTON-EVANS replied that he thought the Service, as now administered, was an improvement on the past, and was adequate.—Mr. MAXTON asked if it was not proper to take the same care to safeguard the interests of soldiers as of the civilian population.—Sir L. WORTHINGTON-EVANS: Oh, at least as great.

TUESDAY, JULY 28TH.

Miners' Nystagmus.

The House went into Committee of Supply on a vote of £113,045 for the salaries and expenses of the Department of Mines.

Colonel LANE-FOX (the Parliamentary Secretary for Mines), replying after the debate, said nystagmus was a most difficult disease to deal with. A short time ago a very interesting report was issued by a committee of the Health Advisory Council, which pointed out that in this country we were more humane than in foreign countries, where they said that nystagmus was largely a nervous disease and that it was a mistake to encourage too many people to think they were suffering from it. The subject was now receiving very considerable attention, and constant research work was going on. A scheme was being elaborated between the Home Office and the Mines Department for dealing with the disease, and he hoped it would shortly be put into operation.

Pay and Allowances of the R.A.M.C.

Colonel DAY asked the Secretary of State for War if he was aware that the recent conference of the British Medical Association had unanimously decided not to print in their official publication any reference to the terms and conditions of service in the Royal Army Medical Corps, in view of what they alleged to be a breach of faith by the Government; and if he would, in view of attracting the best type of medical practitioner into the service, cause a revision to be made in the pay and pension allowances to officers of the Royal Army Medical Corps.—Sir L. WORTHINGTON-EVANS replied: I have seen in the press that the British Medical Association are stated to have adopted the resolution referred to. I recently conferred with the British Medical Association on the subject of the Royal Army Medical Corps, and I hope in the near future to be able to announce decisions on the matters which were then discussed.

Ex-Service Patients Sent to Switzerland.

Colonel ENGLAND asked the Minister of Pensions whether any tuberculous ex-Service men had been sent for their health to Switzerland to undergo the Spahlinger treatment or otherwise; and, if so, what were the regulations with respect to the selection of such cases.—Lieut.-Colonel STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: A few cases of pulmonary tuberculosis have been sent to sanatoria in Switzerland by the Ministry. The cases selected are those in which the department is

satisfied, on the advice of their experts in tuberculosis, that treatment abroad is essential and that equally good results cannot be expected from the facilities available in this country. I am informed that the Spahlinger treatment referred to has, in fact, been given in certain cases as an incident of their sanatorium treatment, but the resulting evidence as to the value of the treatment has not, in the opinion of my medical advisers, justified the sending of patients at the public expense expressly for this form of treatment.

State-aided Housing Schemes.

Captain FRASER asked the Minister of Health how many houses had been built under State-aided schemes during the years 1919, 1920, 1921, 1922, 1923, and 1924, respectively, and in 1925 up to the present date; how many were now in course of construction; how many had been authorised; how many houses had been authorised under the Housing Act of 1923; and how many under the Housing (Financial Provisions) Act of 1924.—Sir KINGSLEY WOOD replied: The numbers of houses completed each year since 1919 in connexion with State-assisted schemes under the Housing Acts were as follows: 1919, 100; 1920, 15,711; 1921, 86,669; 1922, 89,001; 1923, 19,185; 1924, 52,730; and 1925 (up to June 30th), 44,293; total 307,689. Statistics obtained during the last 2½ years show that in addition to this number 160,566 houses had been built by private enterprise without Government assistance in the period between Sept. 30th, 1922, and March 31st, 1925. The total number of houses authorised under the various Acts is 499,464, and on the 1st inst. 63,495 were under construction. Under the Acts of 1923 and 1924 the number of houses authorised to be built are 218,769 and 66,969, respectively.

Closing of Wandsworth Maternity Home.

Mr. VIANI asked the Minister of Health if he was aware that the maternity home of the Wandsworth borough council had been closed; that during the past 17 months there had been 87 cases of mothers suffering from abscesses of the breasts; that complaints had been made by patients and public bodies as to the lack of cleanliness and proper treatment; and that the services of all the staff had been dispensed with except the matron, who was retained and receiving wages as usual; and, in view of these facts, would he institute an inquiry.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the affirmative, and to the third part in the negative. My right hon. friend has, for some months, been aware of the special incidence referred to in the question, but repeated skilled inquiry has, up to the present, failed to elicit the cause of this unusual condition. He is informed that the borough council who have made every effort to grapple with the problem have now decided to close the home temporarily and to give notice to the staff. My right hon. friend is suggesting to the council that a conference should be held locally, at which his department would be represented, in order to discuss future arrangements.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c. FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

TUESDAY, August 4th, to SATURDAY, August 8th.—PRINCE OF WALES'S GENERAL HOSPITAL (N.E. London Post-Graduate Hospital), Tottenham, N. Intensive Course in General Medicine, Surgery, and the Special Departments. Work will begin at 10.30 A.M., and continue until 5.30 P.M., except Saturday, when there will be morning work only (first week).—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Lecture-demonstrations, illustrated by cases daily at 5 P.M. Tuesday, Dr. L. R. Yealland on Disorders of Coordination. Wednesday, Dr. E. W. Scripture on Speech Disorders in Nervous Disease. Thursday, Dr. E. D. Macnamara on Disorders of Posture and Gait. Friday, Mr. L. G. Brown on The Auditory and Vestibular Apparatus in Nervous Disease.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 3rd.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 3 P.M., Dr. Saunders: Medical Wards.

TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrell Gray: Surgical Wards. 3 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Sir Henry Simson: Gynaecological Wards. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—10.30 A.M., Dr. Dowling: Skin Dept. 12 noon, Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations of the Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

BRERETON-BARRY, JAMES, L.A.H. Dub., has been appointed Public Vaccinator for Weymouth and Melcombe Regis.

REID, H., F.R.C.S. Eng., M.B., Ch.B. Liverp., Honorary Assistant Surgeon to the Royal Infirmary, Liverpool.

Ancoats Hospital, Manchester: TWINING, E. W., M.R.C.S., L.R.C.P. Lond., Honorary Radiologist: WELLS, C. ALEXANDER, M.B., Ch.B. Liverp., Resident Surgical Officer; ROBERTSON, MAURICE C. G., M.B., Ch.B. Aberd., House Surgeon; WOOD, KENNETH W., M.B., Ch.B. Manch., Assistant House Physician.

Certifying Surgeons under the Factory and Workshop Acts: KILLARD-LEAVEY, M. E. P., L.R.C.P. Lond., M.R.C.S. (Barnstable); SOUTHERN, W. G., M.B., Ch.B. Manch. (Broughton-in-Furness); MOLLOY, H. H., M.D. Dub. (Helsby, Chester); McDONALD, J. R., M.B., Ch.B. Edin. (Durham).

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Sen. Res. Surg. £330. Jun. Res. Surg. £300.

Barnsley and Wakefield Joint Sanatorium.—Asst. Tub. O., &c. £450.

Birmingham, Highbury Group of Hospitals.—Jun. M.O. £350.

Bristol, Cosham Memorial Hospital, Kingswood.—Res. M.O. £150.

Cairo, School of Dental Surgery.—Supt. and Lecturer in Metal-lurgy, &c. £E.900. Lecturer in Surg. £E.480. Asst. Lecturer in Surgery. £E.360. Lecturer in Mechanics. £E.480.

Chichester, Royal West Sussex Hospital.—H.S. at rate of £200.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Hull Royal Infirmary.—Cas. H.S. at rate of £130.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

London School of Hygiene and Tropical Medicine.—Research Studentships in Tropical Med. £250.

Manchester, Ancoats Hospital.—Pathological Registrar. £100.

Mount Vernon Hospital, Northwood, Middlesex.—Surg. Laryngo-logist.

Pietermaritzburg, Grey's Hospital.—Male H.S. £500.

Royal Chest Hospital, City-road, E.C.—Asst. Tub. O. £550.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £150.

Royal Northern Hospital, Holloway, N.—Anæsth. £10 10s.

St. Mary's Hospital, W.—Cas. H.S. at rate of £100.

Sudan Government, Wellcome Tropical Research Labs., Khartoum.—Asst. Bacteriologist. £720.

Sudan Medical Service.—Medical Inspectors. £E.720.

West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. at rate of £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment for Certifying Factory Surgeons at Wrotham, Kent.

Births, Marriages, and Deaths.

BIRTHS.

COLLINGWOOD.—On July 26th, at Marlborough-hill, N.W., the wife of Prof. B. J. Collingwood, O.B.E., M.D., of a son.

DOUTHWAITE.—On July 21st, at "Carlingford," Worthing, Sussex, the wife of Dr. A. H. Douthwaite, of a daughter.

HAMMOND.—On July 23rd, at "Pemmorva," Harrow Weald, to Norah, wife of A. G. Hammond, M.R.C.S., L.R.C.P.—a daughter.

NIXON.—On July 25th, at 7, Lansdown-place, Clifton, to Doreen G. C. Nixon, M.R.C.S., L.R.C.P., wife of Dr. J. A. Nixon, a son (Gervase John Maplettoft), who only lived an hour, and a daughter.

RANKIN.—On July 24th, at Shubra, Boxmoor, Herts, the wife of T. Thomson Rankin, M.D., of a daughter.

MARRIAGES.

REYNOLDS—STEELE.—On July 22nd, at St. Paul's, Knights-bridge, Captain William Leonard Eliot Reynolds, M.C., R.A.M.C., to Margaret Joan Pattison, only daughter of Mr. and Mrs. W. R. Steele, of Farnham.

DEATHS.

BEATON.—On July 21st, at Highbury New Park, N., after a short illness, Robert Milne Beaton, M.B., C.M., J.P., aged 71.

BOWEN-HOGG.—On July 24th, at Stranraer, St. Peter's-road, St. Margaret's-on-Thames, Richard Bowen-Hogg, M.R.C.S., in his 79th year.

HENDRIKS.—On July 17th, at Bicester, Oxon, after a short illness from septic poisoning, Cecil Morgan Hendriks, O.B.E., M.B., M.R.C.S., in his 70th year.

RUDDUCK.—On July 22nd, at West Mersea, Essex, John Burton Rudduck, M.R.C.S., L.R.C.P., late of Assam and Morocco, aged 72 years. Husband of M. M. Perston Taylor, late of Palestine and Morocco. Buried at West Mersea, July 25th.

WATSON.—On July 22nd, at North Bar Within, Beverley, of pneumonia, Walter Geoffrey Watson, B.A. Camb., M.R.C.S., L.R.C.P., in his 39th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I, 1925.

THE Index and Title-page to Vol. I, 1925, which was completed with the issue of June 27th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

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Notes, Comments, and Abstracts.

POISONING BY SHOE DYES.

CASES of poisoning by anilin and nitrobenzene used in the various dyes for staining boots and shoes have not received much attention in this country, possibly because of their very rare occurrence, but the symptoms produced are alarming and may even prove fatal; hence a knowledge of this form of poisoning is necessary. Dr. C. W. Muehlberger has collected 47 cases from the literature and added nine recent cases occurring in America to form an interesting review of the whole subject.¹ Cases of poisoning following the splashing of anilin or nitrobenzene on the skin have been recorded, painters using anilin-containing paint have been affected and certain cosmetic preparations for the hair containing this substance have also been known to give rise to dangerous symptoms. Even the anilin used to put a laundry mark on diapers has been known to produce effects in infants. Despite the fact that there appears to be some uncertainty about the toxic action of anilin and nitrobenzene, Dr. Muehlberger states categorically that even when perfectly pure these substances are intensely toxic and can be absorbed through the unbroken skin. The symptoms produced come on insidiously within a few hours of the wearing of the shoes stained with these products and consist of an intense cyanosis, often first noticed by the patient's friends, followed by collapse with weakness, dizziness, headache, and vomiting. If the patient be put to bed and the offending footwear removed, recovery usually takes place fairly rapidly, and no other treatment is necessary. At least one fatal case, however, has been recorded in which the autopsy findings showed that the liver was in a condition resembling acute yellow atrophy. Animal experiments have shown that anilin especially attacks the conducting tissues of the heart, giving rise to heart-block and various disorders of rhythm. In no case was methæmoglobin found in the blood although the cyanosis occurring in these cases is frequently ascribed to this cause. Chemical analysis of one particular brand of black shoe dye, known to have caused five out of the nine cases of poisoning reported in this paper, showed that it contained over 40 per cent. of anilin, and the only way to prevent the occurrence of these distressing cases seems to be the prohibition of the use of this substance and nitrobenzene in the manufacture of shoe dyes. Research as to suitable substitutes for these solvents for pigments which shall be non-toxic is said to be proceeding. Even these toxic dyes could be prevented, however, from producing ill-effects if the shoes thus treated were allowed to stand for 24 hours before being worn and if the custom of staining shoes "while you wait" on a person's feet, which appears to be common in America, were discontinued.

HEALTH CONDITIONS IN HONG-KONG.

A REPORT for 1923 gives the estimated population of the colony, including New Kowloon and the new territories, as 681,800, of whom 15,000 are non-Chinese. The birth-rate for the year was 6.97 per 1000 among the Chinese community (but this figure is wholly misleading, as it is impossible to register more than a portion of the births) and 23.03 per 1000 among the non-Chinese community, as compared with 6.25 and 22.84 for 1922. Deaths from malaria numbered 674. The deaths from plague were 136, as compared with 1071 in 1922. Small-pox deaths numbered 1141, of which all but 9 were Chinese. There were 4317 deaths from respiratory diseases other than pulmonary tuberculosis, as compared with 4863 in 1921, and 35 of these were among the non-Chinese community. Pulmonary tuberculosis claimed 1472 Chinese and 31 non-Chinese victims, whilst other forms of tuberculosis represent an additional 605 deaths, making a total of 2108, or 15.36 per cent. of the total deaths among the community. Beri-beri was responsible for 1270 deaths, as compared with 892 during 1922 and 526 in 1921. In the civil hospital, which contains 170 beds in 21 wards, 5455 in-patients and 28,297 out-patients were treated during 1923. The total cases of malaria for all Government hospitals and the Tung Wa Hospital showed an increase of 166 cases, as compared with the year 1922. In the Tung Wa Hospital only Chinese are treated, but European as well as Chinese methods of treatment are employed in accordance with the wishes expressed by the patients or their friends. The lunatic asylum is under the direction of the superintendent of the Civil Hospital. European and Chinese patients are separated, the European portion containing 14 beds and the Chinese 16. 309 patients of all races were treated during 1923, and there were 3 deaths.

Incorporated in 1911, the University of Hong-Kong is a residential university for students of both sexes for the

promotion of arts, science, and learning, the provision of higher education, the development and formation of the character of students of all races, nationalities, and creeds. The university includes the three faculties of medicine, engineering, and arts. The Faculty of Medicine provides a five-year course of study in the usual pre-medical and medical sciences, supplemented by clinical work in the Government Civil and Tung Wa Hospitals, leading to the degrees of M.B., B.S. The degrees of M.D. and M.S. may be obtained for post-graduate work. The degrees above mentioned are recognised by the General Medical Council for registration in Great Britain. With a view to better securing the maintenance of the desired standard—which in the Faculty of Medicine is that of an English university degree—external examiners are, in all faculties, associated with the internal examiners in all annual and final examinations. In the main buildings are housed the chemical, physical, and biological laboratories. Special medical buildings include schools of anatomy, physiology, pathology, and tropical medicine, erected at the cost of Chinese gentlemen resident in the colony.

AN IMPROVED CYCLE SADDLE.

OUR attention has been called to a cycle saddle made by Leatheries, Ltd. (Sampson-road North, Birmingham), at the suggestion of "Kuklos," cycling editor of the *Daily News*. The saddle, which viewed from above has the ordinary contour, is longitudinally divided into two saddles the width of the opening or slot being adjustable at either end. The object of the saddle is to prevent friction or perineal pressure, and the construction should prove useful to patients suffering from hæmorrhoids or after operations involving the perineal region. We are informed that a cyclist weighing 14 stone whose prostate was removed used the saddle for some months with comfort.

SOCIAL ORIGIN OF PROSTITUTES IN MOSCOW.

INQUIRY was made recently in Moscow into the social origin of prostitutes. As the inquiry had nothing to do with the police, and no names were asked for, it was considered that considerable reliance could be placed upon the answers—with one exception, those relating to venereal disease. This was universally denied, a state of things, of course, much too good to be true. S. Weissenberg summarises the replies in the *Zeitschrift für Sexualwissenschaft* for July. 642 satisfactorily completed questionnaires were obtained, the results of which were compared with those of an enquête at Kiev in 1913 on 236 registered prostitutes. Of the latter domestic servants formed 44 per cent., hotel employees 12 per cent., shop assistants 8 per cent., factory hands 6 per cent., only 10 per cent. coming from other social strata. Thus the very large majority was from the lower classes. The same phenomenon appeared, though to a less extent in the Moscow investigation, 60 per cent. of the subjects being of proletarian origin. Domestic servants were only 22 per cent., thus half the former proportion, but this, independently of the variations to be expected with small numbers, could be wholly accounted for by the diminution in the total population of domestics between 1913 and 1925. This factor allowed for, they recruited the ranks of prostitutes to a greater proportional degree than formerly. In the minority were women of origins not previously met with and not always exactly stated; thus "daughter of a high official," "widow of a governor," "noblewoman," "countess," and so forth. The contingent from the nobility and land-owning classes amounted to 5 per cent., as also did those from the ranks of teachers and nurses. It is reasonable to suppose that the upset due to the revolution, with its exalting of the working class and humbling of their superiors, may have had a good deal to do with this modification of the social composition and personnel of prostitution. What also appears evident, thinks the author, is that social conditions cannot take all the blame of prostitution, which attracts those of a particular disposition.

HEDONAL.

To the Editor of THE LANCET.

SIR,—Will any of your readers say whether any experimental laboratory work has been carried out in this country with hedonal intravenously or otherwise in animals?

I am, Sir, yours faithfully,
Glasgow, July 20th, 1925. JOHN DONALD.

Corrigenda.—In our account last week of the Ophthalmological Convention (p. 203) some remarks by Colonel A. E. J. Lister, I.M.S., on cataract, were wrongly attributed to Sir William Lister. In Mr. D. V. Gird's remarks, reported on the same page, the word "hypermetropic" should read "hypermetre."

¹ Jour. Amer. Med. Assoc., June 27th, 1925, p. 1987.

The Relation

OF

PARALYSIS AGITANS TO THE PARKINSONIAN SYNDROME OF EPIDEMIC ENCEPHALITIS.

A Lecture delivered in English at the Royal Society of Medicine on the Invitation of London University

BY DR. RENÉ CRUCHET,

PROFESSOR OF PATHOLOGY AND GENERAL THERAPEUTICS IN THE UNIVERSITY OF BORDEAUX.

WHEN in 1917, taking as my basis observations up to 1916 collected while with the army at Commercy, Verdun, Bar-le-Duc, I described for the first time "subacute encephalomyelitis," later to be known as "encephalitis lethargica," I believed it was a new disease. I remarked then the curious polymorphism of the disease, and specially noted several cases in which the immobile face existed from the first. It was already evident to me that the Parkinsonian appearance was in reality quite different from the disease associated with the name of Parkinson.

Later on, after the great outbreak of epidemic encephalitis of the winter 1919-20, certain manifestations, the so-called "Parkinsonian syndrome," were frequently observed. These manifestations were only the continuation of the early Parkinsonianism; others—much more frequent—constituted earlier or later sequelæ of the acute period of epidemic encephalitis. But in both my opinion was not changed, and I considered this so-called "Parkinsonian" condition to be quite different from paralysis agitans. That was the idea which, with H. Verger and Hesnard at the Société de Neurologie de Paris in June, 1921, I tried hard to get accepted. At that time we were almost alone in this opinion: now our conception is commonly admitted.

For that reason we have tried to find out why excellent observers had confounded the "Parkinsonian post-encephalitic syndrome" with paralysis agitans. We found that in these the symptoms which we have isolated under the terms "bradykinetic syndrome" were common to two distinct pathological states, but that in addition to these common symptoms there were others in which these two clinical types were clearly differentiated. On that account we will study, in the first place, the symptoms common to these two clinical types: the "bradykinetic syndrome," and, secondly, we will point out the phenomena particular to each.

BRADYKINETIC SYNDROME.

A syndrome is constituted by the association of several symptoms. The bradykinetic syndrome—as recently studied with Henri Verger in our clinical lectures at the Hospital St. André, Bordeaux¹—consists in several essential phenomena, of which the most characteristic sign is slowness of movement. The other phenomena are: immobility, fixed attitude, kinesis paradoxa. After considering these we will say a few words on the muscular resistance.

1. *Immobility* is specially remarked in the face which is fixed and expressionless. It is often called the "Parkinsonian mask," although Parkinson has never mentioned it. "Charcot's mask" would be a more exact term. This immobility is found also in all the other parts of the body: there are no longer visible those thousand little movements or tics which are the personal expression of individuality, or underline the course of thought. To the expression of life has succeeded the fixed state of a doll, a mummy, or a waxen image.

2. The *attitude* is equally a fixed one and very characteristic. Generally the body is bent forward, the neck sunk between the shoulders, the trunk stiff, the arms slightly flexed on the forearms, with the

hands brought towards the abdomen, the fingers flexed or extended, assuming what has been known as the writing position. Other attitudes are also met with: a lateral inclination to the right or left, an inclination backwards, and others, which vary with each individual. But whatever the attitude may be, one always recognises the condition by the aspect which is fixed, stiff, rigid, or "wooden"—as it is also called. (Fig. 1.)

3. *Slowness of the movements* is the most important sign. That is why we have designated this syndrome as the "bradykinetic syndrome" (of *bradys*, slow, and of *κίνησις*, movement). The term "bradykinesia" is entirely peculiar to us, and we have used it for the first time in medicine in 1906 in our "Traité des Torticolis Spasmodiques." This slowness of movement is specially striking in the features. The expressions (laughing, astonishment, fear, sadness, attention, &c.) all show a want of spontaneity (Figs. 2 and 3); the slow movement is remarked in speech, opening of the mouth, movements of the lips (as whistling, blowing, &c.), of the tongue, and in mastication and deglutition. All the movements of ordinary life are equally slow. Movements of the head and neck, shoulders, trunk and the limbs, as in walking, sitting down, rising up, stooping, turning, &c., all become stiff and automatic-like.

In acts more complex, as in using the fingers, this bradykinesia is still more noticeable. In drinking, eating, shaving, doing the hair, washing, dressing and undressing, sewing, knitting, rolling a cigarette, folding, writing, playing the piano, &c., patients take a much longer time than they did when in health. The same remarks apply to professional work. We have known electricians, masons, book-keepers, embroiderers, cashiers, typists, &c., who required eight or ten hours for the work they previously did in four or even two hours or less.

It is interesting to particularise the characters of this bradykinesia. The slowness has nothing in common with what one meets with in people naturally slow by birth or temperament. Thus, all these movements seem restricted and stiffened, without the thousand little gestures whose disappearance has already been alluded to in describing the immobility and attitude. For instance, in walking the characteristic automatic movements of the arms are wanting; and in writing or lecturing, eating or drinking, none of the gestures of attention or accompaniment are to be seen. It is important to specify, however, that all these movements are correct and perfectly co-ordinated, though slow. Then, the beginning of the act is never sudden; it seems delayed and to follow at an interval on the act of will which causes it. The longer the act goes on and the oftener it is repeated it becomes slower and slower in its execution. Then stops, of which the length seems to increase, are observed until complete arrest occurs. At last it happens that the movement which is being executed lasts longer than the will to go on with it. Thus it is that the patient who wishes to stop when walking, or who is suddenly told to stop, goes on, against his will, to make a few steps forwards. In walking backwards or sideways the same happens.

4. *Paradoxical Kinesis*.—The term was used by Souques in 1921, but the condition was known to Parkinson himself in 1817. The phenomenon consists really in this, that certain patients, only able to walk slowly and with difficulty, become at times capable of running. One of the two pathognomonic signs of paralysis agitans, as James Parkinson described it, is here indicated—the festinating gait—that is to say, following his words: "A propensity to bend the trunk forwards, and to pass from a walking to a running pace." These phenomena are classical and met with in all the descriptions, principally in Trousseau and Charcot.

A patient, quoted by Souques, who was incapable of making any movement whatever, could at certain moments cross one knee over the other. Incapable during several hours of answering or answering with a few words five minutes after the question was put to

¹ Henri Verger and René Cruchet: Les Etats Parkinsoniens et le Syndrome Bradykinétique, Paris, 1925.

him, he could, at instants, speak easily. That is another instance to which Parkinson makes allusion when he compares the failure of the will of the patient to effect an arrest of his running to the "volubility," "a similar affection of the speech, when the tongue thus outruns the mind." But these phenomena had passed completely unperceived in post-encephalitic bradykinesia till we in 1920-21 pointed them out for the first time. There is no question in the encephalitis of some limited movements which are always the same; the question is of various complex acts, executed in conditions which astonish the mind and constitute a real *activity of contrast*, of which I will speak later.

5. The four preceding symptoms are sufficient to characterise the bradykinetic syndrome. The study of *muscular resistance* is superfluous. It seems, however, that the authors who have specially described it have been the victims, with Charcot, of a preconceived idea. In considering the appearance of these patients, stiff and rigid and wooden, they have deduced an idea of rigidity; and as if that were not enough, others have made it worse and gone on to speak of hypertonus. Rigidity has come to be

FIG. 1.



Postencephalitic bradykinetic attitude.
Bent backwards, mouth half opened.

precaution to tell the patient to remain absolutely passive and to oppose no resistance whatever, they would note that the movements are effected with freedom as in the normal state. If there be a muscular resistance, be it persistent as in lead-pipe, or intermittent as in cog-wheel, it disappears as soon as the first passive movement is ended. When the limb is again at rest, and you want to make it move, this resistance reappears, but disappears again with

thought, since Charcot, the essential element of paralysis agitans. Tremor itself might not be present, and rigidity alone exist; these authors do not hesitate all the same to say that it is Parkinson's disease. Indeed, Parkinson himself would find it impossible to recognise in most descriptions nowadays the disease which bears his name. Tremor, for him pathognomonic, is not thought indispensable, while the rigidity, which he has never mentioned, is regarded as necessary and sufficient.

I do not hesitate to say that this description of Parkinson's disease is deplorable, because in this particular disease the rigidity is wanting, even when it is looked for. If these authors would take the

movement, and so on. Even in typical cases of Parkinson's disease, if it be not too advanced, this so-called rigidity is absent. Thus, the last Parkinsonian case with tremor which I saw some months ago was a man 68 years old; it was enough to put his superior or inferior limbs in complete release, and it was possible to move them in all directions without perceiving the least muscular resistance.

With old cases of Parkinson's disease, evidently, as with certain post-encephalitic bradykinetics, one may

A FIG. 2. B



C

D

The same boy as in Fig. 1 with fixed expressions of the face. A, Serious look with shut mouth. B, Commonly the mouth is open and saliva is trickling out. C, Smiling expression with salivation. D, Laughing, with still more salivation.

observe hypertonus and even the sort of rigidity which recalls the special contracture of spasmodic infantile diplegia; but those are patients ill for a long time. Even in those cases, not even in those of long standing, and often never, rigidity exists such as we have already shown it with Henri Verger.

Thus reduced to its most simple expression the bradykinetic syndrome is common to a certain number of morbid states, amongst which, without speaking of the Parkinsonian disease and epidemic encephalitis, one may mention certain chronic deforming rheumatic cases, progressive lacunar cerebro-sclerosis, disseminated sclerosis and pseudo-sclerosis, dementia præcox, spasmodic infantile diplegia, chronic chorea, athetosis, chronic myoclonus, and myorhythmia. In 1906 we already showed that bradykinesia can become spasmodic and be associated with certain forms of spasmodic torticollis.

But we will limit our study to the particular characteristic signs which constitute the bradykinetic syndrome, as seen in Parkinsonian disease and in epidemic encephalitis.

PARKINSONIAN BRADYKINESIA.

In Parkinson's original description the characters of bradykinetic syndrome are noted. The study of slowness of movements and of immobility, specially of the face, is, however, not particularly indicated. Has

it been forgotten? Or is it not rather that the enumeration of these phenomena did not seem necessary to the author? As it is a question, following Parkinson, of paralysis, these troubles of the least motor activity, so common and so evident, are they not, by definition, a part of the clinical picture? James Parkinson insists only on the particular evolution of this paralysis; he shows its mode of progression, so different from ordinary paralysis, in which "abolition or diminution of voluntary muscular action takes place suddenly." Here, on the contrary, "the diminution of the influence of the will on the muscles comes on with extreme slowness."

There is a quite singular evolution for a paralysis according to the ideas of that period. Parkinson remarks it expressively. The movements of the face and all movements in general are diminished, "weakened," slackened; are these not evidence of a paralysis? Parkinson finds it needless to speak of it.

To return, two phenomena of a new kind strike him in this paralysis, first of all, and specially, the "shaking"; second, "a propensity to bend the trunk forwards." In this

FIG. 3.



Young bradykinetic woman with the same scale of fixed expressions of the face—serious, smiling, and laughing.

second symptom may be recognised the characteristic attitude of the bradykinetic syndrome. "This propensity to lean forward becomes invincible," as Parkinson says; the result being that the patient, "irresistibly impelled to take much quicker and shorter steps, and thereby to adopt unwillingly a running pace"—substitutes "running for walking," so as not to fall. There we find again the phenomenon of "kinesia paradoxa," already mentioned. And it is natural that it should have attracted the attention of a clinician like Parkinson, little accustomed to see paralytics running.

But it is the shaking which gives to the Parkinsonian bradykinetic syndrome its essential and principal character; it is that which is the pathognomonic sign of Parkinson's disease, and so he incorporates it in the definition itself—"shaking palsy." That is why he studies this tremor with such care—an "involuntary tremulous action, in parts, not in action, and even supported." This shaking is the first manifestation of the disease. Most often it begins in one of the hands and

arms, and attacks little by little other parts of the body. A sudden change of position, or walking, stops it for a short time. But the time comes when movements are carried out with more difficulty, whilst the tremor becomes incessant and increases in violence. At the same time, in a progressive manner, the trunk is almost permanently bowed; the patient can hardly run or walk any more; he is no longer able to feed himself, he masticates and swallows with difficulty; even the saliva is continually dribbling from the mouth, and ultimately he dies of extreme exhaustion.

Later works on the subject have added little to Parkinson's account; some details have been particularised in describing the shaking—as a movement like that of pill-rolling or cigarette-rolling. Authors have also laid much stress on the agitation, the instability of these patients, who can hardly keep quiet; but Parkinson had already noted this fact in a few words, when he remarked that to calm the incessant tremor which troubled them, "harassed by this tormenting round," as he says, they continually walked.

In short, the Parkinsonian bradykinesia is essentially characterised by its insidious onset, at an advanced age, its progressive evolution, its mental state (want of movement, irritability, bad temper); its late salivation, and specially its particular tremor which exists at rest and disappears in voluntary action.

POSTENCEPHALITIC BRADYKINESIA.

The bradykinetic syndrome is here quite complete; the general immobility and impassiveness of the face are striking, especially because we are dealing generally with young people.

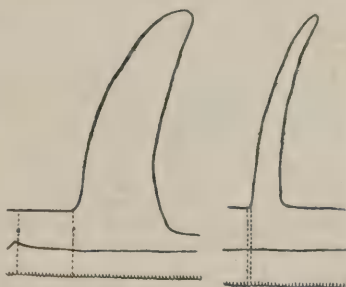
The fixed attitudes are equally remarkable, but more varied than in Parkinson's disease, where the bend-forward is especially characteristic.

Slowness of movement, rather neglected till we described it, has been studied with more precision than with the real Parkinsonian case, on account of the usual absence of tremor. We have noticed the delay in the beginning of movement, then the successive stops till a complete arrest ensues. All these phenomena have been remarked in the acts of ordinary life, and experimentally controlled, on myograms by H. Verger and Hesnard. (Fig. 4.) The modifications of handwriting, with progressive micrographic letters, are well known.

Reading is quite as interesting to study, as we have shown. The patient begins to read in that characteristic dull and monotonous voice; then a sudden stop occurs at the end of the third or fourth line. The eyes are obliged to go rapidly from the end of one line to the beginning of the next, and this movement does not take place immediately. Then it goes on, and reading continues, to stop suddenly again at the end of the line. But little by little, as the reading goes on, the stops are more and more frequent, every two lines, then, every line, and even, in the course of the line, sometimes in the middle of the word. The stops, first of all short, last longer and longer; the voice lowers, and comes to be hardly perceptible, and reading comes to a stop. In acts which require more complex movements, another very curious particularity is noted: it is the stopping of movement in motion, and that in the most uneasy positions. Thus, a spoonful of liquid remains near the lips, held in a sculptural attitude during several minutes; or a draught of milk, or a mouthful of food may remain in the mouth, without being swallowed.

One of my patients, while putting on his trousers, became all at once immobile and bent forward; another, when he wished to pick up something on the floor, bent down, caught the object, and after having lifted it a few centimetres remained for more than a minute in this bent position. Another one, standing, wishing to take his handkerchief from under the pillow of his bed, stretched himself out on it and remained

FIG. 4.



Myogram obtained after an auditory or visual test with a bradykinetic patient. On the curve to the left the reaction-time is longer than in that to the right, which is the curve of a normal man. The distance between the two dotted lines is wider on the bradykinetic than on the normal curve.

immobile and fixed during three or four minutes, with the head forward and the hand held out, a few centimetres away from the desired handkerchief. A patient, quoted by Arthur J. Hall, "when brushing the hair, may raise the brush to the head and then progress no further." One sees in these attitudes, the catatonic perseveration, a truly singular phenomenon.

But it is the paradoxical kinesis which is chiefly remarkable. This activity of contrast, however curious, had passed completely unobserved till we called attention to it in 1920 and 1921. We have described several patients, who showed an inert, immobile and fixed aspect, and yet, all the same, at certain moments could play with a ball, or at battle-door and shuttlecock, or go up and down stairs, split wood with an axe, jump close-legged more than one metre high and three metres distance, even carry out evolutions on the horizontal bar. Others continued to motor, to cycle, play football, skip with a rope, to play the piano, violin, or brass instrument. I have seen three who seemed infirm and quite immobile in an armchair and who, all the same, began to dance in my consultation-room.

One of my patients, a brakeman employed in a railway company, at the arrival of the train in the station, came down from his car, shouted the name of the station in passing before every car, and then returned to his post till the next stage. Another, a man cook, whom they were obliged to help to dress and to eat, beat one day an excellent cream, to the great astonishment of those who surrounded him. He and his comrade, the brakeman, were both very skilful at the game with a cork, which consists in throwing down a cork covered with pennies, at 12 metres distance, with a quoit of the dimension of a guinea thrown with the right hand. They knocked down the cork each time, a rare performance for a normal man and all the more extraordinary under the circumstances.

These cases are now very well known. Arthur J. Hall has described how a "fine strong young man, whose immobile face, posture of limbs, and trotting gait are unmistakable, drove a three-ton lorry from Sheffield to London and back in three days, with nobody but a small boy with him. On another occasion, when leaving the out-patient department, he stepped on to the top-rail of the seat and jumped to the ground with the greatest agility." The same author has seen a young man cross the Strand opposite Charing Cross Station, at the busiest time of the day, by waiting for a momentary lull in the traffic, then trotting to the safety stage and stopping himself by clinging to the lamp standard. The second half of the passage was completed in safety, after a long wait, but he could only stop himself by clutching hold of a passing stranger, who thought the man had been taken suddenly ill, and escorted him to the railings. G. L. Thornton has noted that a young man, 29 years old, "in spite of his complaint of weakness in the legs, was able to jump over low obstacles and to run upstairs."² Finally, it is hardly necessary to point out the absence of rigidity, even less here than in Parkinson's disease. The clinical examination proves it; but the mere persistence of muscular activity, so considerable as to permit the execution of the preceding acts, would be enough to presume it.

That is for the bradykinetic postencephalitic syndrome.

But other complementary or added symptoms allow of a still better differentiation of the postencephalitic bradykinesia from the Parkinsonian bradykinesia. These are:—

1. *Tremor*.—The tremor is far from being the rule here, as in Parkinson's disease. It is, indeed, rare. In more than a hundred of my own cases I noted it ten times (one case in ten). Out of these ten cases, in three only did the tremor exist during rest and disappear during voluntary motion (Parkinson's type). In the seven other cases it did not exist during rest, and neither was it intentional, as in disseminated

sclerosis. It appeared only in certain positions of fatigue, or else in movements which necessitated an effort, such as to write, to eat, to dress oneself, to shake hands, to carry a weight, &c., in which case its amplitude and intensity grew with the violence of the effort, to cease during complete rest.

A farmer, aged 53, was observed to have the tremor only in one position, evidently tiring: when he carried to his mouth a bowl or plate held with both hands, these were rapidly agitated by the tremor, and the liquid (coffee, milk, or soup) was upset. In the case of a typist, 26 years old, when she was asked to make a rapid movement of flexion of the right forearm on the arm, immediately the forearm began trembling at the speed of about seven jerks per second, with an amplitude from 2 to 8 cm. As soon as the patient changed the position of the limb the tremor ceased. But as these movements took place in many acts of ordinary life, such as eating, drinking, sewing, dressing, &c., it became a great nuisance for this young lady. Another character of this tremor, in distinction to the Parkinsonian shaking, is that it is not at all progressive. Several times we have noted it lessening with time; in three cases it completely disappeared in a few months, without ever coming back.

2. *Mental State*.—In contrast with the Parkinsonian bradykinetic, the postencephalitic bradykinetic patient is calm, peaceable, impassive, does not speak, asks for nothing, is willingly somnolent; he has an invincible repugnance to effort, even to the slightest movement. His greatest desire is to remain absolutely quiet, to have complete rest, rather in bed, where he will readily remain the greatest part of the day. To get up, to dress, even to remain sitting, is for him a fatigue which he would gladly avoid.

His intellectual state seems to slacken concurrently with his physical activity. His ideas are clear, his judgment intact, his memory retained, and his reasoning lucid; but to put his powers in use needs infinitely more time than before his illness. H. Verger and Hesnard have strikingly illustrated this bradypraxia or bradypraxis, or *psychic viscosity*. When these psychical modifications are not too marked, the activity is normal, but sensibly slackened; one would say that the patients have assumed a new personality.

An hotel-keeper, 56 years old, a woman, came to see me in February, 1923. She seemed a stolid person, with an expressionless face, speaking slowly and seldom, but perfectly clearly, her movements quiet and deliberate. She went on managing her business, attending to the cash and accounts. A stranger seeing this woman for the first time might very well have taken her for a person of quiet and reserved manner, calm and slow of speech and temperament, but, in fact, she had become so after encephalitis. Formerly she was a very active woman, always ready to laugh, quick and alert in movement and speech, and prompt in repartee. She knew herself to have changed, and complained of fatigue and lassitude. Indeed, her friends did not know her. Her personality had changed. I have seen other similar instances in my practice. Are they not curious and quite different from the proper Parkinsonian mentality?

3. *Onset*.—In contrast to the beginning of the Parkinsonian bradykinesia, "so slight and nearly imperceptible," writes Parkinson, "that it rarely happens that the patient can form any recollection of the precise period of its commencement," the onset of postencephalitic bradykinesia is nearly always easy to recognise. Somnolence, so-called lethargy, diplopia, frequent agitation with oneirism, even when there is no high fever, symptoms pointing to infectious disease, such as typhoid fever, toxic symptoms simulating botulism, enable us to fix the onset of the disease. The epidemic incidence is important. The greatest number of postencephalitic bradykinetic patients, whom we have observed, have had their attack between November, 1919, and April, 1920.

Age Incidence.—The average is about 60 in Parkinson's disease; the lower the age-period the rarer are the cases. On the contrary, with post-

² Brit. Med. Jour., Jan. 3rd, 1925.

encephalitic bradykinesia, the older the age-period the rarer the cases. Even children are frequently attacked—a quarter of the cases in my statistics.

4. *Evolution.*—While Parkinson's disease is fatally progressive, postencephalitic bradykinesia may get better, and even be cured. This depends on whether one deals with the early or the late form. The early form, of which I have observed several cases, is pretty often curable. One also often finds a regression or stabilisation at a certain stage, without a real return to the normal state. But most frequently the late form is met with. It appears between six months and two years, and sometimes later, after the apparent cure of the disease. In that case, unhappily, prognosis is less favourable. However, it is not necessarily progressive and fatal. I have known patients—for instance, the hotel-keeper of whom I have already spoken—where the illness advanced slowly to a certain stage and then remained stationary. With certain people, I have even noted phases of aggravation followed by phases of regression which finally allowed patients to recover an important part of their social activity. Others, on the contrary, become at length real invalids: incapable of moving, mute, immobile in bed, showing often the limbs fixed in flexion or extension, having even eschars on different parts of the body, and finally become extremely wasted and die.

5. *Other Differential Signs.*—We will pass rapidly in review certain other phenomena which serve to separate postencephalitic bradykinesia from Parkinsonian bradykinesia. Salivation is a very frequent and early sign in encephalitis, while it occurs late in Parkinson's disease. Pupillary troubles (inequality, slowness or loss of reaction to light and accommodation, miosis, mydriasis), exaggeration of knee- and ankle-jerks (without Babinski's sign), various changes in the cerebro-spinal fluid—especially hyperglycorachia—are particular signs of the postencephalitic bradykinesia.

A few words are necessary as to torsion-spasms, which are often met with in postencephalitic cases.

6. *Torsion-Spasms.*—In these different parts of the body assume extraordinary and tormented attitudes. I have quoted several cases, some more curious than others, but principally that of André V., whose detailed story is found in our "Clinics of St. André."

This youth, markedly bradykinetic, ordinarily would be found sitting with the head on the right, his chin on his breast, but the face turned towards the left, so that in order to look straight before him the eyes had to be turned upwards, the eyelids being raised to the utmost. The trunk was bent forward, so that only the middle of the back touched the back of the chair. Then the trunk would be bent little by little to the right side; the back, more and more rounded, would form nearly a right angle with the pelvis, the head and the trunk completely off the seat of the chair. In this incredible attitude, which lasted 10 or 15 seconds, it was astonishing how the patient did not fall; then, with a rather rapid movement he would resume his first attitude. And so on the whole day.

Facts of that sort are really very characteristic. But are they as new as is said? I do not believe so. Most authors consider that the neurosis of tonic torsion (Ziehen), or *dystonia musculorum deformans* (Oppenheim), or torsion spasm (Flatau and Sterling), descriptions which date back to 1910 and 1911, belong to the same clinical family as Wilson's disease or hepato-lenticular degeneration, which, too, was described for the first time in 1911 before the Society of Neurology of London. H. C. Hall (Copenhagen) thinks also that pseudo-sclerosis, studied by Westphal and Strümpell, which is but an atypical variety of disseminated sclerosis, is an analogous pathological state. Finally, neurologists have remarked how much these spasmodic phenomena, when localised, remind one of spasmodic torticollis.

SPASMODIC BRADYKINESIA.

It is only true to say that, in 1906, writing from the clinical point of view alone, and prior to the

descriptions given by Ziehen, Oppenheim, Flatau and Sterling, S. A. K. Wilson, and H. C. Hall, we called attention to the same pathological entity, under the name of *spasmodic bradykinesia*—bradykinesia, because the movements were slow; spasmodic, because there were tonic or clonic (rhythmic or arrhythmic) jerks, added to the *bradykinetic phenomena*.³ Since then I have observed other similar cases of which one, quite typical, occurred in 1907.⁴ In short, as we said in 1906 and 1912, we meet with a generalised spasmodic syndrome, causing a rigid, fixed state with stiffness and general slowness of movements. All voluntary acts, whatever they may be, are constrained and slowed: writing, walking, especially going downwards, gestures of the arms, head, and trunk. The execution of movements often exaggerates the spasmodic condition. Frequently, at rest, there are athetotic and choreiform movements of the extremities; muscular instability of all the parts of the body; evidence of vasomotor troubles (sweating or excessive redness of hands, armpits, feet); alterations of speech, which is slow, stammering, and difficult to understand. And we added: "One cannot say that it is chorea, athetosis, paralysis agitans, Little's syndrome, disseminated sclerosis, tabes, Thomson's disease, or spasmodic wry-neck. Without doubt certain symptoms recall some of these diseases, but in themselves they are not sufficient to bring them under any one of these categories. That is why I proposed to name them *spasmodic bradykinesia*."

There is a perfect concordance between the views of these authors and those which we put forward about 20 years ago. Even then we already recognised that these curious states were not the real Parkinson's disease. The discovery of epidemic encephalitis, increasing considerably the number of these bradykinetic forms and their spasmodic varieties, formerly regarded as exceptional, has but confirmed our conceptions. It has allowed us in the meantime to study them better and to observe that the spasmodic state was, in most cases, but secondary, and not essential to the real bradykinetic state. These torsion spasms take place with the *associated forms* which unhappily always complicate, in medicine, the pathological descriptions.

Epidemic encephalitis, more than any other illness, on account of its polymorphism, is predestined to share in this confusion of classification. In our first article of 1917, the earliest to appear on this disease, we had already, founding on our personal observations, shown the diverse clinical forms it could take. We have already indicated the most typical and simple varieties, avoiding the associated forms. It is that same method which has guided us in the statements we have just made.

MORBID HISTOLOGY OF THE BRADYKINETIC SYNDROME.

The morbid histology of acute epidemic encephalitis is to-day well known. The first case, of which the definite histopathology was made out, goes back to April, 1917. It was one of my patients who died in Bar-le-Duc, near Verdun, and my colleague Anglade (Bordeaux) examined the microscopic lesions. He was immediately struck by their resemblance to the histologic lesions of hydrophobia and poliomyelitis in the mesencephalon, both due to filter-passing virus. Now, we find these figured in all the books and, particularly, in the remarkable work of Arthur J. Hall on epidemic encephalitis. I wish here only to consider the lesions connected with the Parkinsonian syndrome. I will not speak of the constant lesions of nerve-cells which are greatly altered in the same manner (reduction, atrophy, destruction), either in the cerebral cortex, hind-brain, grey nuclei, or in pons varolii, peduncles, and anterior horns of the cord. I desire simply to emphasise the curious property of the pyramidal cells to be intensely stained by

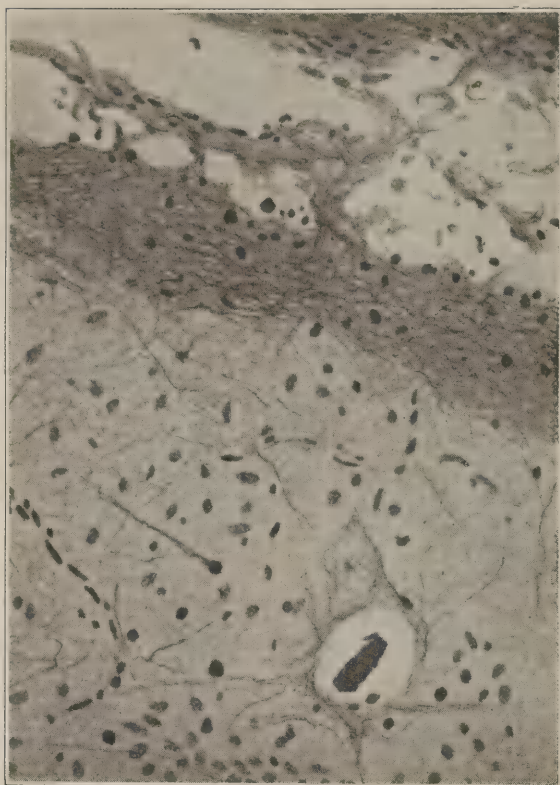
³ *Traité des Torticollis Spasmodiques*. Paris. 1907. Pp. 346-394.

⁴ *Bradykinésie Spasmodique*, in *La Pratique des Maladies des Enfants*. Paris: J. B. Baillière et Fils. 1912. Pp. 377-380.

histological dyes. Also I must add, and it is very important, that the lesions are destructive, insular, unsystematised, and especially marked in the locus niger.

Anglade explains certain forms of Parkinsonian postencephalitic lacunar sclerosis by a neuroglia sclerosis. It is quite an original point of view. In fact, here (Fig. 5) it is not the adventitia of arteries which is involved as it is in the classic lacunar arterio-

FIG. 5.



One can see the glia wall, and in the middle of it, the glia cells and fibrils falling down: that is the first stage of the special Parkinsonian postencephalitic lacunar sclerosis.

sclerosis. The vessel remains intact; but around it the thick wall of glia cuff is losing, little by little, its cellular elements and crumbles away and falls down. Lesions of the locus niger are very intensive, there being almost total destruction of ganglion cells, which are phagocyted by glia cells. The pigment disappears in the substantia nigra and is absorbed by glia cells. Neuroglia fibrils are not very thick, but are always of the *insular* form, which is the chief character of the histopathology of epidemic encephalitis. There are no lacunar lesions in the aqueduct of Sylvius, red nucleus, and locus niger. But, nevertheless, the lesions are very important.

CONCLUSIONS.

We have studied the bradykinetic syndrome in its elementary form; then we have shown that the additions found in the Parkinsonian and post-encephalitic types mark them out as original diseases, perfectly differentiated. From what we know of the diffusion of the encephalitic virus over nervous centres, it is easy to understand that it may give birth in certain cases to the true Parkinsonian type—2 or 3 per cent. in our statistics. But this simple statement shows how rare the syndrome is.

Equally we can well conceive the association of the Parkinsonian and postencephalitic type, as we have seen a few cases. But it is only an associated form; which must necessarily be divided in two

essential types, if we will talk about it in a good medical sense. That is why, after all, we always return to consider separately the Parkinsonian and post-encephalitic bradykinesia. We take a firm stand on the sure ground of clinical observation; for anatomical findings, however interesting they may be, do not yet permit us to localise in a certain and definitive way the lesions which cause the bradykinetic syndrome, and the two forms which we have studied.

But this is the true medical method, that of all great doctors in all times and in all countries, the one, in particular, of Sydenham. I do not believe that any better or surer has been discovered. It is that at least which we try to practise in the Bordeaux University.

Croonian Lectures

ON SOME

DISORDERS OF MOTILITY AND OF MUSCLE TONE, WITH SPECIAL REFERENCE TO THE CORPUS STRIATUM.

Delivered before the Royal College of Physicians of London

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LECTURE IV.

(Concluded from p. 219.)

TREMOR.

By comparison with chorea and athetosis, tremor is a motor derangement of a vastly simpler character. It may be defined as a succession of similar movements at equal intervals—more precisely, as a more or less regular, rhythmical, alternating contraction of a muscular group or groups and their antagonists. This definition, however, is not as precise as it appears, for the clinician encounters very fine and quick tremors, felt rather than seen, in which the alternation is difficult to determine, while other rhythmical conditions are much more elaborate than ordinary tremor, and others still closely resemble the latter superficially yet have a different origin. Various complex alternating movements of an "involuntary" sort have been grouped by the French under the term of "rhythmic," but this, of course, is more descriptive than definitive. For the purposes of this section, attention will be confined to tremors whose organic origin is matter of general acceptance.

CLINICAL CHARACTERS OF ORGANIC TREMOR.

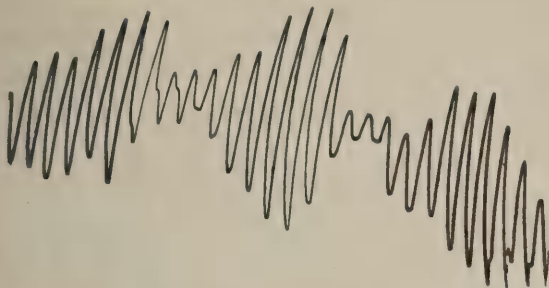
(1) *Rate*.—Doubtless some tremors are slower than others, yet the rate of the periodic muscular contraction is fairly constant, averaging from four or five to seven or eight a second. This rate is not apparently a function of the length of the muscles concerned, for careful measurements in cases, say of paralysis agitans, will as a rule give the same figure for short muscles such as the interossei or other small hand muscles and for larger ones such as those of the neck or trunk. Tremors of wide excursion are not of necessity slower; if anything, they are sometimes rather faster than tremors of narrow limits. From a study of numerous examples of striatal disease the average rate is six a second, as near as may be. This rate is found to vary within very moderate limits at the instance of factors both of an extrinsic and an intrinsic kind.

(2) *Range*.—Every intervening grade from the finest range to a coarse and wide movement may be met with; and in the same patient the excursion often varies from time to time, sometimes in a regular,

sometimes in a highly irregular way. Fig. 33 taken from a case of postencephalitic Parkinsonism (unilateral) exhibits this range variation clearly, and a fair degree of regularity in the variation. Irregularity of range excursion is seen in Fig. 34 (also from a postencephalitic case).

(3) *Rhythm*.—On the whole, the majority of organic tremors exhibit a rhythm from which they

FIG. 33.



Tremor in Parkinsonism. Variation of amplitude with a certain regularity.

depart but rarely; the tremor is set in such and such a way, and modification seldom occurs. The rhythm of the hand movement in the Parkinsonian from whom the tracing of Fig. 35 was secured is almost mechanical in its perfection. Fig. 36 represents another Parkinsonian tremor, of equally clock-like rhythm but of variable amplitude.

(4) *Localisation*.—While theoretically any set of skeletal muscles and its opposite group may be seized upon by tremor, from the lips, or the fingers, to the trunk, the small muscles of the body are more particularly its seat. A mere catalogue of tremor localisations would serve no useful purpose; what is of greater interest is the curious way in which tremor will shift its incidence in a moment from one group to another. I have noticed this particularly in cases of progressive lenticular degeneration, but it is a feature also of not a few cases of paralysis agitans. For example, a flexor-extensor tremor at the wrist will change to one of a side-to-side character (radial-ulnar deviation), or give way to one of pronation-supination, and so forth. Again, it sometimes will migrate in a still more extended fashion, leaving the arm, or its distal segments, to pass to the head or trunk, or to the opposite side of the body. The records reproduced in Figs. 37 and 38 are from a case of progressive lenticular degeneration with a pronounced tendency of this kind for the tremor to "wander." Within a second or two of placing the tambours in position for a record of a wrist flexion-extension tremor it shifted its incidence to the pronator-supinator mechanism, but returned a few seconds later to the original group, with reduced amplitude (Fig. 37). On another occasion (Fig. 38) a rhythmical and seemingly unvarying pronator-supinator tremor altered its character as soon as the tracing started, and eventually left the group altogether, passing to the biceps-triceps combination.

This variability or fluidity of distribution is suggestive not of a fixed structural disorder so much as of a morbid process or state prone to develop itself in such and such a muscular combination as a sequel to the interjection of some additional factor, the nature of which will be discussed a little later.

A more remarkable illustration of this fluctuation is provided by a phenomenon which I have now observed some four times in cases of unilateral

Parkinsonism, in each instance following epidemic encephalitis. The particulars of one case may be given.

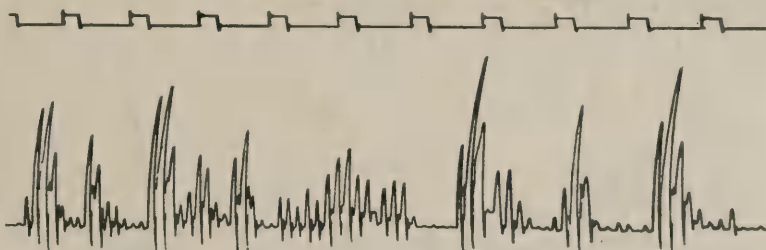
It was that of a youth of 19, with left-sided Parkinsonism of a fairly severe character; his left hand and arm exhibited a typical rhythmical tremor which became particularly noticeable if the limb was unsupported, e.g., held out in front; support at all the joints either reduced it materially or caused it to disappear. On the right (normal) side was no sign of pyramidal or extrapyramidal disturbance. The right arm could be held out by itself with absolute steadiness. Now, when both arms were outstretched the left at once exhibited marked rhythmical tremor of flexion-extension at the wrist, and invariably, a second or two later, the right outstretched and unsupported (normal) hand went into a similar but finer tremor. Support applied to the left limb cut short its tremor, and within two or three seconds the fine right tremor would then disappear (Fig. 39).

Thus a limb in every objective respect apparently normal developed a tremor whenever its fellow of the opposite side, rather severely involved in Parkinsonism, developed tremor; its tremor followed on the appearance of the Parkinsonian tremor, and ceased with cessation of the latter, yet both beginning and end always occurred a second or two later in the case of the former. Its range was much finer, but its rate and other characters were identical. This phenomenon is of considerable interest, furnishing, as it does, additional proof of the fluidity of many organic tremors—a feature to be taken into account in respect of pathogenesis.

CONDITIONS INFLUENCING TREMOR.

We should derive a false notion of organic tremor if we contrasted it only with the known changeableness of so-called "functional" tremors, imagining change to be typical of the latter and fixity of the former. Numerous "functional" tremors vary in minimal degree, while organic tremors can be and are influenced by a whole series of factors, as will now be exemplified. When the back of the hand of a Parkinsonian patient whose tremor is in full swing is momentarily pricked with a needle the tremor may cease for many seconds. Fig. 40 is the tracing from

FIG. 34.



Parkinsonian tremor. Highly irregular amplitude.

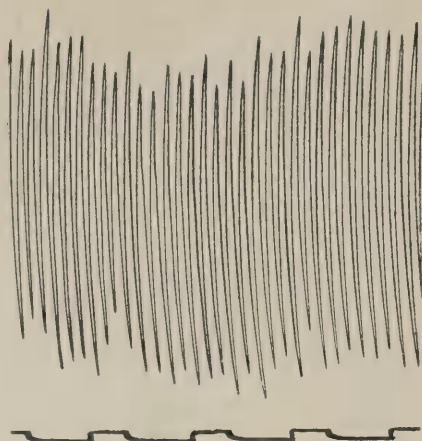
such a case; at the arrow signal the dorsum of the moving hand was pricked for a moment and in this instance something like ten seconds elapsed ere it recommenced. (The crescendo character of this Parkinsonian tremor should be noted; the point is referred to below.) In a similar case of finer tremor the cessation thus produced lasted only for a second or two. In still another case, of rather irregular tremor (Parkinsonian), the cutaneous stimulus effected a transient interruption, followed, however, almost immediately by an exaggeration of the movement.

Other forms of extrinsic excitation may produce an effect. At the arrow signal in Fig. 41 (idiopathic paralysis agitans) the sudden loud bursting of a paper bag filled with air caused no more than the briefest disturbance of the rhythmical tremor, but sometimes the effect has been more pronounced. Stimuli of an emotional sort may or may not have their influence; attention in this respect is a disturbing factor. I have always obtained better

results in the maintenance of tremor for recording purposes when the subject's eyes have been closed, to exclude visual stimuli. Not a few patients discover for themselves means of checking the involuntary movement, if only for a time. One of my patients could at once cause his tremor to cease completely by the simple procedure of supinating

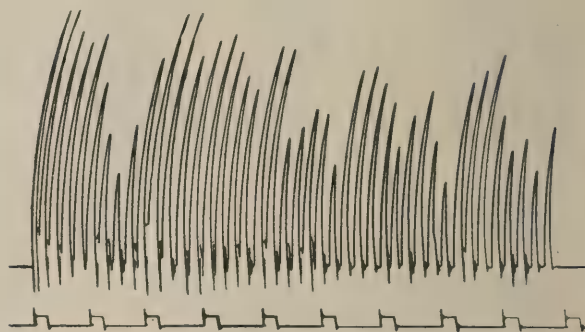
"voluntary" motion, while the first variety occurs also when the limb is at rest. The supposed distinction has been recognised for centuries; it was already old when James Parkinson referred to it, quoting with evident approval the views of Sylvius de la Boe and of Sauvages, and indeed the germ of the idea is discoverable in the pages of Galen. In

FIG. 35.



Parkinsonian tremor: almost mechanical rhythm.

FIG. 36.



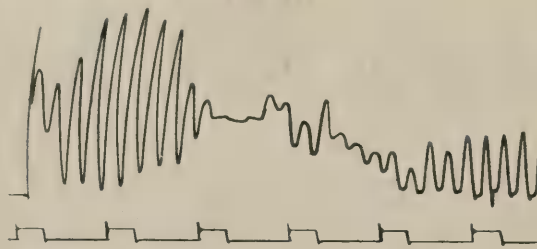
Parkinsonian tremor. Regular rhythm but variable amplitude.

his affected forearm and hand. In another case, hyperpronation ("voluntary") had precisely the same effect. (A cinematographic record of this phenomenon was shown.) Intelligent patients often work out for themselves some proceeding which has the desired result. This did not escape the acute observation of James Parkinson, who says in his essay that "the wearisome agitation is borne until beyond sufferance, when by suddenly changing the posture it is for a time stopped in that limb." He cites the case of a Parkinsonian patient, who, "to illustrate his observation as to the power of suspending the motion by a sudden change of posture, being then just come in from a walk, with every limb shaking, threw himself rather violently into a chair, and said, 'Now I am as well as ever I was in my life.' The shaking completely stopped; but returned

Parkinson's words: "If the trembling limb be supported, and none of its muscles be called into action, the trembling will cease. In the real shaking palsy the reverse of this takes place; the agitation continues in full force whilst the limb is at rest and unemployed; and even is sometimes diminished by calling the muscles into employment."

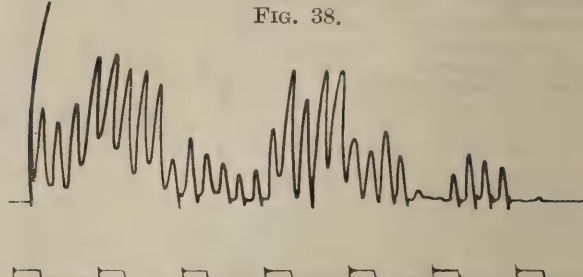
Notwithstanding this authority, the distinctions are much more apparent than real; some cases of disseminated sclerosis, for instance, definitely show what I may call a "rest-tremor" as well as an "action-tremor," while in progressive lenticular degeneration, as was demonstrated in my original monograph, the tremor is increased by voluntary action to a pronounced degree, though it is also prominent in the resting state. Thus combinations occur and invalidate distinctions. Moreover, in the

FIG. 37.



Progressive lenticular degeneration. Shifting of incidence of tremor.

FIG. 38.



Same case as Fig. 37. Shifting of incidence of tremor.

within two minutes' time." In other instances, however, it vanishes for reasons as elusive as they are inconstant.

CLINICAL VARIETIES.

For years clinicians have recognised certain distinctions between the tremor of paralysis agitans and other striatal affections and that known as intention or action-tremor, the latter being characterised by the fact that it begins only with "voluntary" innervation and increases with continuing action or "intention" up to a point, whereas the former is not so increased but may, on the contrary, diminish or cease. Further, action-tremor is seen only during

finger-nose test the Parkinsonian limb at first often exhibits diminution or cessation of the tremor as it goes into action, yet after a moment or two of "rest" on the nose the fingers again become agitated, although the innervatory action of the limb musculature continues and the limb is certainly not "unemployed." Clinical observation proves further that while in some instances a Parkinsonian tremor is checked by firm "voluntary" closure of the fist of the affected limb, in other cases the effect is transient and minimal, and the tremor redevelops notwithstanding the active "employment." The exaggeration of the tremors of progressive lenticular degeneration by "voluntary" movement is strictly comparable

to what obtains in disseminated sclerosis—an organic state to which “intention-tremor” is by some inaccurately, as I think, confined.

Reduction or cessation of tremor by supporting the limb—a reputed characteristic of action—, as compared with Parkinsonian, tremor—is met with nevertheless in the latter disease on occasion. Its occurrence has been shown in Fig. 39, taken from a typical case of the postencephalitic variety. On the other hand, the tracing of Fig. 42 is derived from a case of what I believe to be so-called idiopathic tremor, though I admit it is now exhibiting symptoms possibly suggestive of paralysis agitans. In this instance the tremor, at first seen solely during unsupported action of the limbs and vanishing instantly with support, is at length beginning to appear in the “resting state.” On occasion, more-

are set at such and such a pace and, left to themselves, vary within narrow limits only. The fifty-a-second rhythm of motor nerve impulses is practically a constant. Instances of inherent neural and neuromuscular rhythms of minimal modifiability might be multiplied. By analogy, organic tremor is a physiological phenomenon of high organisation and low variability, for as we have seen its fundamental characters alter little and its average rate is fairly constant. It is constituted by a rhythmic discharge of neural energy, appearing in pathological states—a release-phenomenon set in a particular rhythm the innate nature of which, and its *raison d'être*, seem at present to be quite uncertain.

Clonus, similarly, consists of a rhythmical alternation in contraction of muscular groups, is a physiological state of a low order, falls into approximately

the same rhythm as tremor, and undoubtedly tends to manifest itself when disease sets free inferior mechanisms. That tremor and clonus rates of contraction should not vary greatly from each other cannot be a pure coincidence, even though the anatomical cause of their respective releases be structurally different in each.

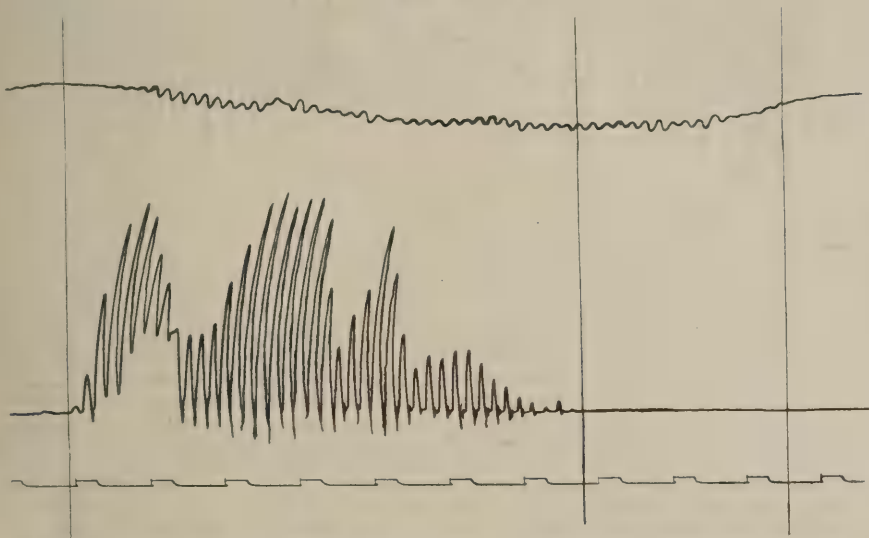
(2) This neuromuscular rhythm being normally held in check by inhibition and demonstrable only in certain diseased or abnormal states, the next point is whether for its appearance a particular condition of low motor centres, or of the muscles themselves, or both, is requisite.

It is not found clinically in states of complete “paralysis.” A paralysed and flaccid limb is never the seat of tremor. On

the contrary, relative integrity of motor power is essential, and if as the result of an additional lesion a limb that has been exhibiting tremor is temporarily paralysed, one of the clinical concomitants is temporary disappearance of the involuntary movement. A fair number of cases are on record of the disappearance of tremor after an ictus of a hemiplegic kind, but it is important to note the absence of the tremor corresponds only to the time during which by diaschisis the *lower* motor neurones are functionally out of action; with some restitution of their proper activity, though the hemiplegia remains, the tremor will reappear. I have myself reported a case of this kind, in which syphilitic mesencephalitis was associated with the clinical symptom of tremor; a “stroke” led to cessation of the tremor, but only for a time which corresponded to the complete outfall of function throughout the corticospinal system; the movement reappeared after this acute stage, implicating *lower* motor neurones by diaschisis, was over. One hundred years ago James Parkinson observed a case of paralysis agitans where a sudden stroke paralysed the right side of the body; “during the time of their having remained in this state neither the arm nor the leg of the paralytic side was in the least affected with the tremulous agitation; but as their paralysed state was removed, the shaking returned.” I am not aware of any recorded case where tremor has *permanently* disappeared after an ictus involving the pyramidal tract, and that alone.

(3) As a corollary, for the appearance of tremor clinically the muscles implicated must be in a certain state of tone. Atonic limbs do not exhibit the pheno-

FIG. 39.



Unilateral postencephalitic Parkinsonian tremor. Temporary appearance of tremor on the unaffected side (above). For details see text.

over, Parkinsonian tremors exhibit a crescendo feature (cf. Fig. 40), which is reminiscent of the similar crescendo of action-tremors.

Finally, in this place, we may express doubt whether any hard-and-fast line can be drawn physiologically between a “resting” and an “active” state of muscle; action-currents in respect of these two differ only in a quantitative way. Clinically it seems a matter rather of degree of innervation than of differences in kind. From consideration of the data the conclusion is, that the two types tend to run into each other and that neither is pathognomonic of involvement of a particular mechanism, radically distinct from that of the other.

NATURE AND PATHOGENESIS OF TREMOR.

From its very nature we must allow that tremor can only be a phenomenon of a low physiological order, essentially different from the elaborate spontaneous movements of chorea and of athetosis. Tremor is purposeless and seems to have no “meaning,” at least none easy of recognition, whereas choreic and athetotic action is subjectively purposeful if none the less futile.

(1) Various neuromuscular mechanisms are highly organised in the nervous system; others are organised in low degree or scarcely at all. Superior mechanisms are capable of great variation; inferior mechanisms are largely systematised. The more highly organised a mechanism, the lower is its physiological position. Spinal reflexes—e.g., the scratch-reflex—cannot be modified in respect of rate or character by variation of stimulus; cardiac and respiratory mechanisms

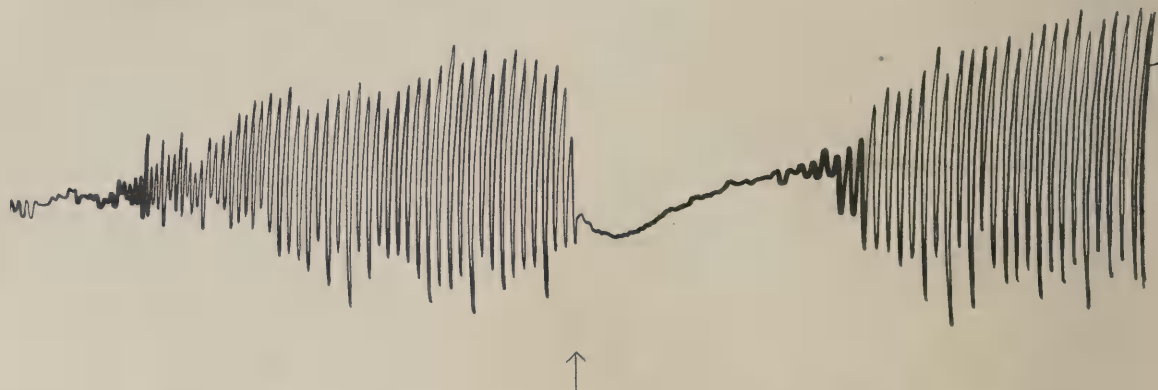
menon; they may be hypotonic, however, and, as a fact, also, either ordinarily tonic, or hypertonic. We must therefore ask ourselves whether any relation or proportion can be shown to exist between the manifestations of tremor and of muscle tone.

Of the common simultaneous occurrence of tremor and of muscle rigidity no question can arise; paralysis agitans is a frequent and convincing instance

degeneration. Precisely those cases have exhibited the "wildest" tremors in which muscular rigidity has not been extreme.

Taking, next, cases where we have reason to suppose cerebello-mesencephalic lesions exist, rhythmical tremor resembling that of Parkinson's disease may be associated with a hypotonic state of the musculature. A number of such cases have been personally observed, and others have been made the subject of

FIG. 40.



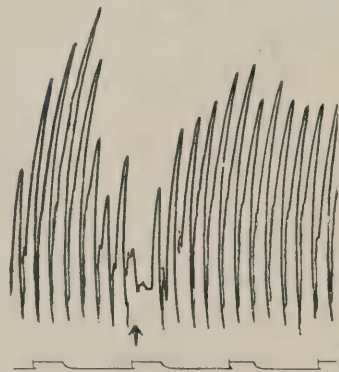
Parkinsonian tremor. Cessation after momentary cutaneous stimulus.

of the coexistence of tremor and rigidity; on the other hand, we have to explain the similar coexistence of tremor and hypotonia in not a few cerebellar cases. To take the former first: my studies lead to the conclusion that, clinically speaking, *those cases of Parkinsonism that are most rigid show least tremor, or tremor that is most limited in amplitude.* I have been able to convince myself of this interrelation by the frequent observation in postencephalitic cases, that with diminution of the rigidity by treatment the patient will likely pass through a stage in which the tremor becomes correspondingly more obvious.

study by Holmes in his Croonian Lectures (1922). I am not able to cite any clinical instance of such tremor having been modified by subsequent alteration of the hypotonia through additional disease to a hypertonia, though were such a case to be studied and reported it would prove valuable.

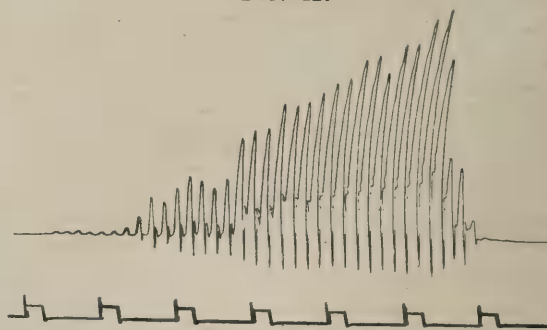
According to a view expressed by Holmes, tremor is seen in hypotonic states only when "both the agonists and their opponents are contracted," as when a finger is to be held steadily say close to the nose without actually touching it. Diminution of postural tone allows the limb to oscillate, failure

FIG. 41.



Parkinsonian tremor. Transient inhibitory effect of auditory stimulus.

FIG. 42.



Tremor (organic) produced when limb is unsupported and ceasing when it is supported.

Several patients have made this observation independently and have commented on it. Conversely, tremor wide in excursion and sometimes almost violent is seen in cases where rigidity is at a minimum. Further, in any ordinary case of the syndrome those muscular groups which are more rigid (proximal segments) always exhibit less tremor than those that are less obviously rigid (peripheral segments), and the same remark is true in respect of lips, tongue, &c. Similar observations have been made for other striatal conditions such as progressive lenticular

of fixation being followed by alternating contractions of certain groups of muscles and their antagonists. His explanation, however, only applies to cases where a hypotonic limb is being held "voluntarily" in such and such a position without support. Now we have seen similar oscillatory tremors to develop in limbs that are not hypotonic, as in some cases of paralysis agitans; and in the study of progressive lenticular degeneration, where also the musculature is hypertonic, analogous tremors have often been seen. Again, some cerebellar tremors of a regular,

rhythmical sort are seen when no "active" innervation is taking place, as when a limb is hanging over a chair or over the edge of the bed (Holmes). That "voluntary" innervation is not a factor in the "spontaneous" tremors of resting limbs is of course obvious; nor is gravity a consideration, for the limb may be so placed as to counteract its action, yet the tremor continues.

Evidently, as tremors that are clinically indistinguishable can be seen to develop in limbs whose musculature is of differing degrees of tone—hypertonic or hypotonic—no explanation based solely on the state of tone can be applied universally. It is commonly understood, I think, that the rhythmical alternating discharges of clonus are dependent on enhanced muscle tone in the units concerned; an abrupt passive stretching effects a "stretching contraction," and this in turn will bring about a similar contraction in the antagonistic group, and so on almost indefinitely, so long as adequate tension is passively maintained. No explanation of this kind is applicable to the "spontaneous" tremors encountered by the clinician. Nor is any elucidation based on the presence or absence of "active" innervation sufficient to cover all the facts.

While, then, as regards diseased states characterised by both tremor and rigidity the degree of the latter is usually in inverse proportion to the extent of the former, we are not justified in claiming the tremor to be an expression of the muscular state *per se*. It is never found in the extremes of absolute atonia or hypertonia, but apart from these it may invade muscles whose tone varies within rather wide limits. Hughlings Jackson considered tremor and rigidity as it were opposite aspects of the same thing; he said that "tremor differs from rigidity, not fundamentally, but in degree," and explained the latter as being tremor "run together." He applied the idea in several other directions; for example, he spoke of a "diluted convulsion" as producing a condition "superficially like tremor." Again, he said that if by some magical process the movements made by a man in running were to occur simultaneously, "the result would be, not any movements properly so called, but an arrest of locomotion by a stiffening of the body into one attitude, a contention of all movements of locomotion." The applicability of this ingenious conception to the present question will be at once apparent to the reader. In a recent communication Walshe, however, declares the view that tremor and rigidity are interrelated to be "wholly untenable," although, curiously enough, he does not mention it as being due to Hughlings Jackson. That they are sometimes thus related is clear from their occurrence in inverse ratio, as illustrated above in Parkinsonian cases; but in other instances no such proportionate connexion is demonstrable.

(4) The fact that tremor is not found clinically either in cortical or in spinal cases I consider of prime significance. A lesion of the corticospinal system is not by itself sufficient to produce tremor, as everyone knows. As far as I am conversant with the literature, no case of tremor is on record pathologically in which the lesion has not involved grey matter situated somewhere in the vicinity of basal ganglia, mesencephalon, or cerebellum. In pointing out the occasional temporary cessation of established tremor by a corticospinal lesion, I do not admit the possible inference that, as Hunter states, "impulses through the cerebrospinal tracts are involved in the production of spontaneous tremor," if thereby the cortical arc is thought to be essential for its appearance. On the contrary, the evidence points in a quite other direction.

Brief consideration of the above-mentioned general localisation of the lesions associated with the appearance of tremor clinically at once suggests the existence there of some prespinal (supraspinal) centre or centres of control over a lower mechanism, whose activity expresses itself in the form of rhythmical alternating contractions of a given muscle group and its opposite, at a more or less set rate. Following the invariable

rule, we say that since the lesions associated with tremor are destructive the supraspinal centre controls or inhibits, and when it is injured the lower mechanism is "let go." The alternations of tremor are, of course, an instance of reciprocal innervation, contractions of opposite muscles succeeding each other harmoniously in a never-ending series. We thus reach the conception that for tremor a particular condition of low motor centres is requisite, and that the state of tone of the muscles themselves is of less significance. None the less, it does not seem to be a mere coincidence that the levels of the lesions associated with tremor are also those from which alterations of muscle tone in large degree arise.

I must in the present instance leave on one side the data that might be adduced from experimental physiology to aid in specifying with greater exactitude the localisation of tremor-effecting lesions, as far as in the present state of knowledge we are able to do so. A brief excursus, however, may not be out of place.

Magnus has not seen tremor in any of his experimental "thalamus" animals, and comments on this absence of involuntary movement apropos of current striatal theories. Now in that animal *both* the corticospinal paths *and* the corpora striata are cut off from the parts further back (lower down)—an experimental state not in any way comparable to the lesions usually associated with the development of tremor in man. In fact, few if any experiments hitherto have satisfactorily reproduced the kind of case the clinician frequently encounters. That tremor, none the less, is occasionally producible by experimental methods is known from the work of Economo and Karplus, and of Lafora. In Graham Brown's stimulation experiments on the mesencephalon (decerebrate animal) tremor has been obtained in the red nucleus vicinity. I had the opportunity of seeing one of the hemi-decerebrate cats of Bazett and Penfield, and observed tremor in the advancing of the limbs on the affected side. The now rather older experiments of Ferrier and Turner on the superior cerebellar peduncle have lost none of their importance *quâ* the experimental production of tremor.

(5) Clinico-pathological evidence does not at present enable us to pronounce with certainty on the relative claims of the corpus striatum and the cerebellum (naming only two collections of grey matter) to constitute that tremor-controlling supraspinal centre which in view of the data here collected and the argument advanced we are justified in postulating. In former communications an attempt was made, possibly somewhat rigidly, to connect tremor with the lenticulo-rubro-spinal path. I have never doubted, and further pathological knowledge only serves to substantiate, the general conclusion formerly reached as to the localisation of the lesions underlying its appearance; their relative limits have already been specified. But a purely clinical study of the present kind cannot give us all the material requisite for final decisions.

Viewed from another angle, however, as we have seen, tremor is to be considered the outcome of activity of a low-grade physiological mechanism released from a *non-volitional* prespinal centre, and it therefore becomes a matter of some interest to ascertain the relation of "volition" to, and its degree of control over, this *otherwise* decontrolled (say) mesencephalo-spinal mechanism.

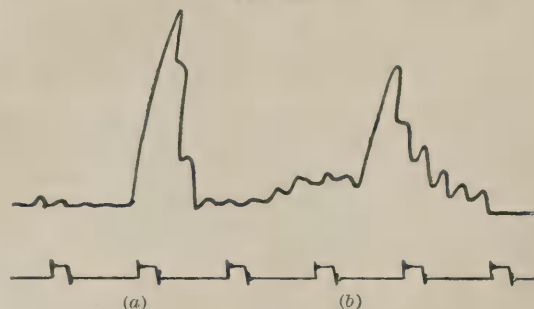
THE PROBLEM OF "VOLUNTARY" CONTROL OVER AN "INVOLUNTARILY" DECONTROLLED MECHANISM.

The question, it will be realised, is a particular instance of an interesting physiological problem of which other examples readily suggest themselves. When a low-level centre is under the inhibitory influence of say two higher level centres of different kinds, one "volitional" and the other "non-volitional," what difference, if any, does the

withdrawal of the latter control effect in the manifestations of the former control?

In the matter of tremor, "voluntary" influence is variable, fleeting, and not to be foretold, as it were. Thus during "voluntary" innervation of a tremor-exhibiting group of opposite muscles (say flexor-extensor) the current may suffice to blend the

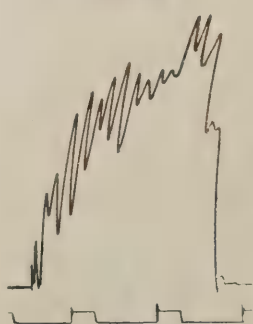
FIG. 43.



Parkinsonian tremor inhibited during "voluntary" contraction of affected muscles.

"involuntary" innervations into a tetanising contraction, of one or other muscle, as may be, with corresponding (relative) disappearance of the phenomenon for the time. Yet this is by no means constant, for in other instances "volition" augments and exaggerates existing tremor, or, alternatively, seems to bring out a latent state of this, existing as it were *in potentiâ*. Attention is directed to the accompanying figures. Fig. 43 is a direct tracing from the left quadriceps extensor cruris of a Parkinsonian patient with moderate rigidity and well-marked typical tremor. At (a) and at (b) "voluntary" contractions of the quadriceps were made, and during the ascent of the curve (shortening of the muscle)

FIG. 44.



Parkinsonian tremor not inhibited during "voluntary" contraction of affected muscles.

no tremor contraction is visible, though these begin again at once with decontraction, and continue. Now in the case of another equally characteristic example of the affection (Fig. 44) no such checking of the "involuntary" contraction is seen; on the contrary, it is traceable both in ascent and descent of the curve (contraction and relaxation of the extensor communis digitorum). Similar circumstances to those of Fig. 43 obtain in the record reproduced in Fig. 45, from another case (also left quadriceps). At (a) and (b) "voluntary" innervation serves to blend, or inhibit, "involuntary" innervations; at any rate, they are no longer to be recognised. If the reader will look back at Fig. 16, he will see how existing tremor is inhibited during the "voluntary" contraction of the extensors of the fingers and begins at once when the summit of contraction is reached, while during synchronous and equally "voluntary" (in the sense that the whole movement is one of "volition") decontraction of the extensors of the wrist the tremor maintains itself. The involuntary contractions blend with the "voluntary" contraction, but not with the "voluntary" relaxation that is going on simultaneously.

No other conclusion, I submit, can be drawn than that "voluntary" control over an "involuntarily" decontrolled mechanism is both imperfect and uncertain. It is unable to prevent the phenomena from making their appearances. The amount and maintain-

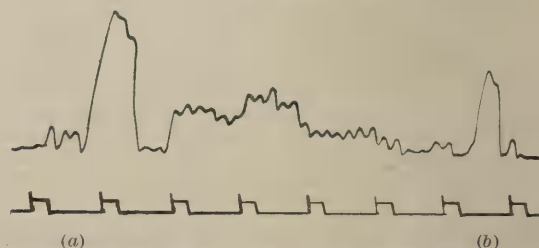
ance of control are alike so variable that they preclude the possibility of similar fixed structural defects being responsible for the phenomena in every case. In a given instance it seems difficult to say what the interrelation of higher and lower mechanisms will turn out to be; tremor may be transiently inhibited by "voluntary" employment of muscles, or, on the contrary, it may accompany such action and refuse to be controlled—and this in different examples of the same disease. I believe considerations of this kind enable us to understand better the essential fluidity and variability of the clinical manifestations of tremor as described in preceding sections.

CONCLUSIONS CONCERNING TREMOR.

Summarising the results of the foregoing analysis of tremor, I may indicate some conclusions:—

Tremor cannot be due solely to a particular or specific manifestation of muscle tone, for it is met with in hypertonic, tonic, and hypotonic states; the fact of its being set in a rhythmical way at an average rate of fair constancy suggests it is the expression of an inherent property of neurocellular activity; its

FIG. 45.



Parkinsonian tremor: "blending" of "involuntary" contractions during "voluntary" innervation.

mechanism is of low physiological grade and is controlled by an ("involuntary") prespinal centre or centres at the general level of corpus striatum, cerebellum, and mesencephalon.

"Voluntary" inhibition of this "involuntarily" decontrolled mechanism is essentially imperfect, inconstant, uncertain, and unsustained.

Tremor differs in fundamental characters from choreo-athetosis, above all in the fact that the law of reciprocal innervation is not abrogated in its case. Its underlying mechanism is quite distinct from that of the other group.

Tremor is an involuntary movement belonging to the old motor system (infracortical, subpallial), while choreo-athetosis is an involuntary movement of the new (cortical, pallial) motor system.

MOTOR FUNCTIONS OF THE CORPUS STRIATUM.

No pretence has been made in these studies to cover the whole field of striatal symptomatology, since they have been oriented from a somewhat different viewpoint. Much of the research, however, has an obvious bearing on theories of the function of that particular collection of grey matter, so that some discussion of our analyses of motor and muscle tone disorders is desirable in this connexion.

At the outset the serious obstacles in the way of reaching final conclusions were enumerated. Our uncertainty as to the diseases to be designated striatal (and solely striatal) on precise neuropathological grounds was specially emphasised, and hesitation in respect of these is still both natural and warrantable, notoriously as far as Huntington's and Sydenham's chorea is concerned. By comparison Parkinson's disease and progressive lenticular degeneration may be supposed to be less equivocally striatal.

Clinical analysis of various types of movement, and of the precise symptomatology of the two last-named affections, gives the following results. The

assertions that they are characterised by "loss" of associated movements, reaction and defence movements, movements of cooperation, have been shown to be inaccurate. The view assigning a localisation of "automatic" movements to the corpus striatum is equally devoid of foundation. The law of reciprocal innervation holds for movement in striatal cases of the above group. Catatonic phenomena have no place in the syndrome. Still other points indicative of misinterpretation of alleged striatal motor symptoms have been recapitulated at various stages in the course of the lectures.

It may be of interest, perhaps, to refer now to one or two fallacies that have been noted in regard to movements and their meaning and localisation.

(1) One of the more serious is that which draws a hard-and-fast line between "voluntary" and "automatic" movements. No such line as a fact exists. "Automatic" movements, it will be granted, have been originally acquired, and, consequently, have at one stage contained a definite "voluntary" element. The child learns to walk. The supposition that this class of movement is at some unknown time transferred physiologically from a cortical locus to a striatal locus is devoid of any sort of probability and unsupported by any sort of evidence. However "automatic" walking and arm-swinging become, they remain faintly "voluntary." As I have previously urged, the gradation is not from "voluntary" to "automatic," but from "least automatic" to "most automatic," or from most to least "voluntary." After permanent lesions of the pyramidal system many acquired "automatic" movements are permanently lost. Were the intact corpus striatum the seat of these, they should exteriorise themselves via the lower motor neurone, which is not impaired *per se* in hemiplegias.

The other side of this question, so to speak, is that I have shown many cortical movements do not contain the element of "volition," but otherwise are similar in every respect to "voluntary" acts. Complex and elaborate tics are an instance in point, as are the motor phenomena of chorea. Before epidemic encephalitis became a clinical commonplace, tics were on their intrinsic clinical and aetiological characters with entire correctness attributed to disorder of cortical function. Some writers now appear to envisage all motor symptoms through an encephalitic fog, arguing for a striatal localisation of peculiarly elaborate movement-complexes because, forsooth, the virus of encephalitis has a striatal site in Parkinsonian cases! Such a claim can be made only at the expense of utterly ignoring the intrinsic clinical features of the movements in question. The corollary is logical, that if postencephalitic tics and bradykinetic syndromes are a sequel to striatal destruction, they must require for their activity non-striatal mechanisms. No hint is given as to where these are situated; but, assuming from the complexity of the movements that they are of cortical type, the inference would be that the corpus striatum is higher in the physiological hierarchy than the cortex itself, and that it controls the latter, so that when it is disordered cortical activity is "let go." This is contrary to all our conceptions of cerebral physiology.

The argument in preceding pages has pointed in the direction of a transcortical failure of inhibition in the case of high-type movements such as those of chorea, and the same argument is applicable to tics and similar involved and intricate movement-combinations. Continuing this line of discussion, I have already alluded to the fact that movements obtained experimentally from the motor cortex proper are not identical in all respects with the movements of "volition." Physiologically, they are of a lower class. The clinical phenomena of Jacksonian epilepsy bear out this view. I have seen individual muscles in pathological contraction from disease of the motor cortex, muscles that cannot be innervated "volitionally" in the same way. For example, I have seen in a Jacksonian case twitching of the right fore-

finger and thumb (a usual symptom, and of course not inherently different from "voluntary" movement of the same part) with *simultaneous twitching of the right levator menti alone*—this latter illustrates the present point. Again, I have observed distinct and prolonged *unilateral* twitching of the rectus abdominis in a Jacksonian case. I do not require to adduce more data to show that morbid processes can effect individual muscular contractions from the motor cortex, and that movements physiologically coupled can be dissociated similarly by cortical motor disorder. Further, interference with and derangement of the harmony of action of component muscular units in movement may occur at the cortical level and have been fully illustrated.

The Betz-cell anatomical area, then, is no more than a midway station between what I should prefer to call the true motor area of "volitional" action—viz., some much larger cortical region, possibly the frontal, and the lower centres of the pons, medulla, and cord. Clinical analysis of choreo-athetotic symptoms has shown us every variety of physiological dissociation and dysharmony in contraction of opposite groups, and converging lines of evidence have suggested such disintegration may take place at the cortical level.

(2) A second fallacy is common and insidious, consisting in the tendency to attribute to lesions at one physiological level symptoms which may in fact arise at more than one. If integration of neural levels is essential to harmonious motor activity the possibility of disintegration through a series of levels must be steadily borne in mind. I have illustrated the point in the case of such symptoms as micrographia, akinesia, poverty of movement, and catatonias. Since such symptoms may be caused by dysfunction at more than one neural level, no exclusive apportioning of the particular symptom to an anatomical lesion on one only can be justified. For several Parkinsonian symptoms I have shown above the probability of the intervention of a "conscious" factor. Not a little of the seeming akinesia follows from the patient's unwillingness to initiate movements that he knows will entail an effort. "Awareness" has been proved to play a part in the meagreness of the reaction- and defence-movements of some Parkinsonians. In these latter types the implication of cortical arcs is highly probable, since the selected excitations reach the sensorium. If they are to be set down to striatal activities alone, and their absence to striatal disease, we are faced with the assumption that striatal function is a conscious function, for which it appears to me no evidence whatever can be adduced.

(3) A third source of confusion in a difficult subject arises from the variability of the symptoms called striatal at different times and under different circumstances, of which numerous clinical instances have been provided in these lectures. To identify symptoms with anatomical lesions thus becomes an unusually delicate and precarious business. As long ago as 1912 stress was laid, in discussing the pathogenesis of tremor and other involuntary movements, on the possibility of dynamic modifications of function without recognisable anatomical lesions. "Loss" of movement is a very elastic term. We have had more than one illustration above of the habit of arguing that "loss" of a movement justifies the supposition that the normal ganglion is the centre for precisely those movements which are considered to be "lost." What, then, is the anatomical state of the organ when movements are present at one time and absent at another?

I should like, in conclusion, to approach the problems that have occupied our attention from still another point of view.

(1) It is a priori highly improbable, and contrary to the dictates of common sense, that motor phenomena so conspicuously diverse and of such varying complexity as myoclonus, tremor, athetosis, chorea, tics, bradykinesia, torsion-spasm, micrographia, and

palilalia, should one and all be set down to disorder of striatal function. When we remember the histological simplicity and comparative structural homogeneity of the corpus striatum, in contrast with the greater dimensions, much more intricate cyto-architectonic complexity, and far wider connexions of the rolandic motor cortex, the idea of attributing all these disturbances to striatal disease, and of crowding corresponding "centres" into that ganglion, becomes nothing short of ludicrous. And we have seen that this Betz-cell area itself is physiologically inferior to a still larger motor region, which much cogent evidence suggests may be constituted by the frontal lobes. Too little attention has been devoted by striatal enthusiasts to the phenomena of apraxia or dyspraxia, to the movements of so-called coördinated epilepsy, to the syndrome of tonic innervation, to epilepsy partialis continua, and to other cortical and transcortical disturbances exteriorising themselves in motor symptoms, some of which at any rate are of a kind persistently attributed to affections of the corpus striatum.

In this connexion an anatomical look-round will help to correct distorted perspectives. The corpus striatum is a much simpler morphological structure than the cerebellum, simpler even than the optic thalamus, in which nuclear organisation has reached a stage unknown to its neighbouring ganglion. But no neurologist has hitherto assigned to disease of the cerebellum a heterogeneous miscellany of motor disorders of the kinds with which the corpus striatum is sorely overloaded. Some would reduce cerebellar function, perhaps with reason, to two or three elements, or even unify it completely. How, then, a relatively simple cell-fibre structure like the corpus striatum can mediate functions ranging from language (cf. palilalia) to innervation of muscle fibre (cf. myoclonus) is on the face of it inexplicable.

(2) Consideration of the intrinsic clinical features of some of the motor disorders put down to striatal dysfunction proves that under no circumstances can they be conceived of as resulting from defect or destruction of identical or similar mechanisms, for while some are physiologically of a high order others are of a low. Some can be understood only on the view that they contain elements belonging to the cortical series.

(3) My clinical studies have impressed me again with the belief, for which much support has been furnished here, that striatal symptomatology and striatal function must be comparatively simple; and they have forced me to the conclusion that the unwieldy and top-heavy symptom-complex which has gradually come to be erected on the ganglion must be rigorously stripped of non-essentials. In the preceding pages have been indicated the symptoms which must thus be discarded.

I have found no reason to modify in any important respect the syndrome originally enunciated, to the effect that the main features of disease of the corpus striatum consist of disorder of muscle tone regulation and the appearance of involuntary movements. These being "positive" symptoms, their causation is the freeing of non-striatal mechanisms from striatal control. The corpus striatum is a body one of whose functions is tone-control, for in its diseased state tone over-develops in the skeletal musculature generally; another of its functions is that of inhibiting the physiologically lower function of neuromuscular rhythm, for when it degenerates tremor is prone to make its appearance. I do not think, however, that in either respect its function is unique and exclusive of that of other centres of approximately the same order.

The "negative" symptoms of striatal disease would be constituted by actual loss or outfall of—what? Clinical analysis will not allow me to point to a single class of movement which is as a fact persistently and completely lost when the ganglion is out of action. We have had many instances of the ways in which different classes of movement are hampered as a sequel to striatal disease, but none of

an absolute paralysis of any class. Fine movements of small muscles are seriously impaired—if the expression is preferred, "lost"; but then they are "lost" also in pyramidal disease. In this, as in certain other respects, gaps in our knowledge of striatal function remain to be filled.

Throughout these lectures no attempt has been made to assign separate functions to the composite parts of the whole ganglion, for in this region in particular speculation has completely outrun both clinical and pathological facts. On a previous occasion I have assembled the arguments against this special variety of striatal conjecture.

These studies were undertaken in the hope of making a further constructive addition to our knowledge of the basal ganglia, and if in some ways my results should seem rather of a negative or destructive kind I can only say that revision was sorely needed.

A STUDY OF THE FAMILY HISTORIES OF 300 PATIENTS SUFFERING FROM CHRONIC UPPER ABDOMINAL LESIONS.

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THE patients under consideration were all under the care of my two chiefs, Mr. James Sherren and Mr. E. C. Lindsay, at whose suggestion this investigation was carried out, and to whom I am indebted for permission to use the figures obtained.

The lesions present were of four types: Chronic gastric ulcer (simple), 95; chronic duodenal ulcer, 129; carcinoma of the stomach, 30; cholecystitis, 57; total 311.

In every case the diagnosis was definitely confirmed at operation, and, where necessary, by further pathological investigation. Some cases showed more than one lesion—hence the total number as shown in the table exceeds the number of patients.

Some patients with one or more of these upper abdominal conditions have given very interesting family histories, which show a remarkable tendency to the occurrence of these lesions in members of the same family. The following are striking examples:—

CASE 1.—A glass packer, aged 50, was admitted into the London Hospital and transferred on June 20th, 1925, to Mr. J. Sherren. At operation three days later the diagnosis of duodenal ulcer was confirmed. The familial tendency is shown below.

CASE 2.—A medical student, aged 24, admitted under Mr. Sherren, Dec. 12th, 1924, with a history of recurrent attacks of biliary colic. At operation the gall-bladder contained no stones, but showed evidence of chronic cholecystitis and was removed; the diagnosis was confirmed on pathological examination. The family history given is tabulated below.

Further examples will be quoted later. Of those investigated the most striking histories were obtained from those patients suffering from duodenal and gall-bladder lesions. The occurrence of such family groups as these leaves one with the undoubted opinion that there is a distinct family tendency to these diseases.

Familial Tendency.

Little has been written on the subject, but in 1921 there appeared an interesting article by Hurst,¹ who drew attention to the undoubted existence of such a familial tendency, and expressed surprise that the fact had been rarely recognised in the past. This same point was also emphasised by Sherren² in 1924.

An attempt was made to estimate this tendency by means of records of a long series of cases. 300 consecutive cases operated upon have been investigated, each patient being asked as to the family history, and any history of indigestion has been counted as a

¹ Hurst, A. F.: *Guy's Hospital Reports*, 1921, lxxi., 450.

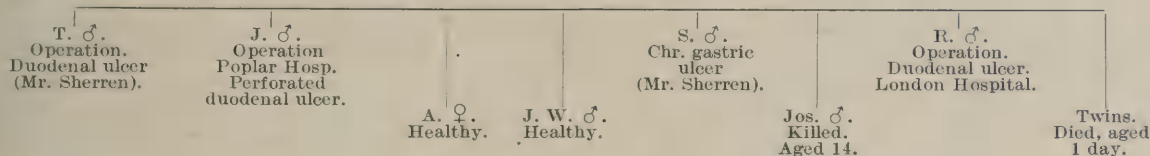
² Sherren, J.: *THE LANCET*, 1924, i., 477.

positive case. The term "indigestion" is, however, one which is very loosely used, and as in the majority of instances no exact diagnosis could be obtained—a control series of 100 cases, none of which patients

The above figures confirm the fact already stated that there is a distinct family tendency to these diseases, though probably these figures, which are of necessity based on that extraordinarily vague term

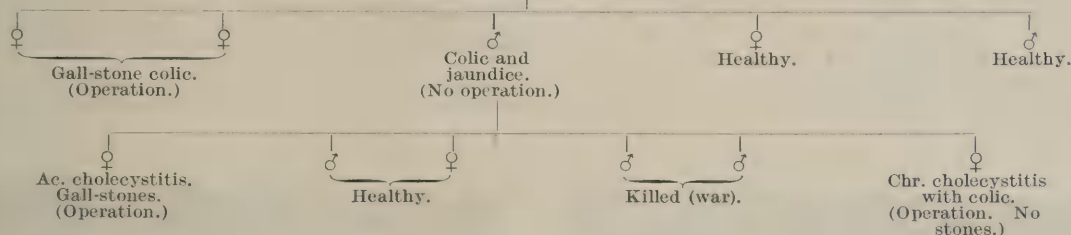
CASE 1.—Family History.

Father, dead—"stroke."
Mother, dead—suffered from similar condition to patient.



CASE 2.—Family History.

♀ Suffered "gall-stones." Died recurrent attacks of colic and jaundice.



suffered from indigestion or abdominal disease, was obtained. The results are shown in Table I.

TABLE I.

—	No. of cases.	No. with indigestion.	Per cent.
Upper abdominal lesion ..	300	137	46
No history of "indigestion" ..	100	16	16

It is of interest to compare the frequency of these family histories in the various lesions, and this is shown in Table II.

TABLE II.

—	Total cases.	No. with indigestion.	Per cent.
Duodenal ulcer ..	129	56	43
Gastric ulcer ..	95	47	49
Gall-bladder ..	57	24	42
Carcinoma ..	30	10	33

The points to be noted about Table II. are:—

1. The manner in which the percentage agrees in the first three groups.

2. The lower percentage shown in the carcinomatous cases. Carcinoma of the stomach may arise clinically in one of two ways—(1) primary, (2) secondary to a chronic ulcer. In carcinoma the familial tendency is not nearly as strongly marked; at the same time it should be noted that the percentage is higher than in the 100 "no indigestion" cases, and this is probably accounted for by the fact that in some of the cases the carcinoma arose on an old ulcer.

3. The gastric ulcer cases show the highest figure, although it has already been pointed out that the more striking histories are obtained in the duodenal and cholecystitis patients. This may possibly be accounted for in the following way—the duodenal ulcer tends to run in healthy families, whereas the gastric occurs as a rule in a family with a lower standard of general health, and so there is more probability of other extraneous causes of indigestion being present—e.g., ptosis.

"indigestion," are of less importance than family histories, such as those recorded above in which the lesions were proved at operation.

Hurst in his article says:—

"It is an interesting fact that I have never myself seen one member of a family in whom the presence of a gastric ulcer was proved, and another in whom a duodenal ulcer was certainly present. This suggests that the types of stomach which predispose to the development of gastric and of duodenal ulcers respectively are congenital, and either one or the other may exist in several members of the family."

Although Hurst states that he has never proved the presence of a gastric and duodenal ulcer in two members of the same family, such cases do undoubtedly exist; three such cases I quote below.

In Case 1 mentioned above it will be seen that three brothers were proved at operation to have duodenal ulcers, whereas a fourth one, who was also operated upon, had an ulcer situated on the lesser curve of the stomach. Two further cases are as follows:—

CASE 3.—On Nov. 15th, 1923, a male, aged 30, was admitted and later operated upon for chronic duodenal ulcer. His mother had previously been operated upon for a carcinoma, which had supervened upon a chronic simple ulcer of the stomach.

CASE 4.—In February, 1925, a man of 40 was operated upon for acute cholecystitis; his father had previously been admitted and operated upon for a perforated duodenal ulcer.

The suggestion that the types of stomach predisposing to gastric and duodenal ulcers respectively are familial is probably largely true. There is, however, also probably a family tendency to certain infections which predispose to the formation of peptic ulcers; such are dental caries, as is shown below, and appendicitis, as mentioned by Sherren.² Now as probably in a family there are often the predisposing factors to both infection and the localisation of the ulcer, it is from members of these families that we obtain the most striking histories in which many suffer from one particular lesion—e.g., duodenal ulcer. If, however, the infection is the only common predisposing factor, then in one patient the lesion may be a duodenal ulcer, and in another member of the same family a gastric ulcer or gall-bladder infection.

The latter is illustrated in the first case mentioned, for in a family of four brothers, two, who were X rayed, had stomachs of different types—one high and hypertonic and the other low and sagging. In all the four brothers, however, there was a very definite history of marked dental caries preceding the onset of symptoms.

THE VALUE OF LIPIODOL IN THE DIAGNOSIS OF BRONCHIECTASIS.

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In cases of unilateral bronchiectasis good results may be obtained by artificial pneumothorax or thoracoplasty. Usually, however, the disease is

was no longer offensive. The collapse, however, was not complete owing to adhesions and areas of adherent pleura and, as so often happens in such cases, the lung was gradually drawn out and the pneumothorax cavity obliterated by the spread of these adherent patches. The symptoms returned and he became ill once more. As he had shown such great improvement when the lung was collapsed it appeared that there could be very little disease in the other lung, and he seemed to be an ideal case for thoracoplasty. This was performed and there was an immediate improvement, but unfortunately he contracted pneumonia and died.

In many cases, however, there is so much adhesion of the pleural surfaces that artificial pneumothorax cannot be induced at all, and it then has to be decided whether the better lung is sufficiently healthy to justify so serious an operation.

The following case illustrates the value of lipiodol in helping to form an opinion as to the state of the better lung.

The patient, a man aged 41, is a motor mechanic who enjoyed good health until February, 1922. He then had an illness which was diagnosed as influenza and pneumonia. Since that time he has had a cough and sputum, and every two or three months he has a febrile attack during which he brings up a quantity of offensive sputum. In October, 1924, he had an attack of dry pleurisy on the right side,

FIG. 1.



Radiogram taken before injection of lipiodol. Left lung apparently sufficiently healthy to justify thoracoplasty.

FIG. 2.



Radiogram taken after injection of 20 c.cm. of lipiodol into the trachea. Condition of left lung contra-indicates thoracoplasty.

bilateral, and it is owing to this that the treatment so frequently fails. If an artificial pneumothorax is induced the quantity of sputum is reduced, but if there is disease in the other lung this reduction may be insufficient to afford the patient any real relief. The refills can then be stopped and the lung allowed to re-expand. If, however, thoracoplasty has been performed it is another matter.

In one of our cases, a man with bronchiectasis had a large quantity of very foul sputum, was toxic, and running a high temperature. After an artificial pneumothorax had been induced he rapidly improved. He became afebrile, and what little sputum was left

and he went into a sanatorium. There were signs of fibrosis in the upper zone of the right lung, but although the sputum was repeatedly examined, no tubercle bacilli were found. At present his general condition is good between the febrile attacks and does not suggest any active tuberculous disease. He has great clubbing of the fingers. The right side of the chest is flat below the clavicle, and the percussion note is impaired all over the right side. Crepitations are heard at the right base and axilla, and there are a few below the right clavicle. On the left side expiration is slightly prolonged, the percussion note is resonant, and a few crepitations are sometimes, but not always, heard at the base. During the febrile attacks there is an increase of signs at the right base and axilla, but not on the left side. X rays (Fig. 1) show extensive fibrosis of the greater part of the

right lung with interlobar pleurisy. The left lung shows only a general emphysema with some peribronchial thickening. Both from the clinical and X ray point of view it would appear that there is not sufficient disease in the left lung to contraindicate a right-sided thoracoplasty, if, as is probable, artificial pneumothorax cannot be induced. After injecting 20 c.cm. of lipiodol into the trachea with the patient lying on the left side, X ray (Fig. 2) showed very considerable disease at the base of the left lung, and on this account one could not advise a right-sided thoracoplasty.

We have seen more than one case where nothing was found in the better lung which seemed to contraindicate thoracoplasty, yet (after attempts to induce artificial pneumothorax had failed) the patient received no benefit from the operation, owing, no doubt, to disease in the other lung. The mortality from the operation for thoracoplasty is by no means negligible. Apart from this, it is a drastic method of treatment which cannot be lightly recommended, and lipiodol is undoubtedly of value in coming to a decision whether a case is suitable for the operation.

Reviews and Notices of Books.

THE CRIPPLED HAND AND ARM.

By CARL BECK, M.D. London: J. B. Lippincott Company. 1925. With 302 illustrations. Pp. xi. + 243. 30s.

THE author of this book, a well-known Chicago specialist, has had ample opportunities of dealing with the various types of deformities of the hand and arm as the result of abnormal development, injuries and disease, and that he has made good use of those opportunities. As he states in his introduction, this work involves a great deal of plastic surgery, and, indeed, this book might well have been called "the plastic surgery of the upper extremity."

Part I. includes chapters on the normal anatomy and physiology of the part, and the rest of it is devoted to the consideration of crippled hands. In Part II. disturbances of the wrist, forearm, elbow, and upper arm crippling the hand are dealt with, and there are a few pages on artificial arms and a short chapter on technique. For the cure of webbed fingers, after describing some of the classical methods, including the impracticable one of Didot, Dr. Beck advocates the formation of a tunnel at the bottom of the interdigital cleft by means of a modification of Rochet's procedure for urethroplasty. For congenital defect of phalanges he recommends what is known in Europe as phalangisation of the metacarpals, but he seems to be unaware that he is not himself the first to use such a method. Priority, however, is of little moment compared with the excellent result obtained in the case here described. Hands crippled in all sorts of ways and to varying extent by mutilating injuries and burns have offered to the author a wide field of work in which he seems to have displayed high judgment and great patience. The truly heroic treatment recommended for Dupuytren's contracture of the palmar fascia should be noted. Dr. Beck considers that the only satisfactory method of treating an advanced case is by excising the whole of the skin and fascia of the palm and substituting for it an Italian graft from the chest or abdomen. He records a successful case. Part II. is, perhaps, of less interest. It will be noticed that, as he himself confesses, Dr. Beck is very fond of the method of Tagliacozzi, and relies largely upon it to provide skin to fill the numerous gaps made by his straightening operations, taking his grafts generally from the chest and less often from the abdomen. We are surprised to find no reference to Volkmann's contracture, which might surely have furnished the author with opportunities to display his skill and resourcefulness.

As a record of actual experience this book will be of the greatest use to surgeons who are engaged in treating such lesions as it describes.

PSYCHOTHERAPY.

Principles of Psychotherapy. By Dr. PIERRE JANET, Member of the Institute, Professor of the Collège de France. Translated by H. M. and E. R. GUTHRIE. London: George Allen and Unwin. 1925. Pp. 322. 10s. 6d.

As a descriptive psychopathologist Janet is unrivalled, though even in his own country the value of his clinical work is not fully recognised, and whilst we are aware of the modern "plague of nerves" we do not profit by his teachings to investigate properly the symptoms of those smitten by the plague. His theory of the dissociation of consciousness provided, both for the manifestations of hysteria and for psychological automatisms, a unifying conception which held the field till the more dynamic theory of the unconscious seemed better to satisfy our craving for explanations in terms of cause and effect. But, though Janet shows the theory of the unconscious to be in the direct line of descent from the observations of Charcot and himself at the Salpêtrière, yet he summarily rejects this later development and places psycho-analysis in the same category as animal magnetism. A third of the book is given to a history of psychotherapies, from the religious treatments like those that made famous the temple of the Asclepieion, through the practices of the animal magnetists to those of the hypnotists, to the methods of Christian Science and the moral suasion of Dubois. Running through all these Janet sees a constant trickle of therapeutic success, but superficial and inexact interpretations have stopped the evolution of processes of treatment that in themselves possessed usefulness and power. Janet's own interpretation of psychopathological disabilities depends upon a postulate of "psychic tension" and the belief that by proper stimulation this tension can be raised or that by economy the "psychic income" can be made sufficient for the needs of life. He notes the importance of "influence" in treatment, and from the practical aspect his methods consist in a thorough understanding of the patient with deliberate guidance and encouragement when the influence is established. As was to be expected, the book is full of shrewd observation, but the reader who comes to it with the hope of learning easy methods of psychotherapy will be discouraged. Janet is cautious as well as experienced, as he shows in writing: "It is not enough for such patients to give them advice or to correct a fault. Patients who have disorders of intelligence, belief, or will, must be made to understand such advice, made to accept it, made to carry it out. This is something very different, and the treatment remains for the most part a problem of psychology."

The book is translated into English which is on the whole easy although there is an occasional obscurity of meaning.

Collected Papers. Vol. III. By SIGM. FREUD, M.D., LL.D. Case Histories. Authorised translation by ALIX and JAMES STRACHEY. London: The Hogarth Press and The Institute of Psycho-Analysis. 1925. Pp. 605. 30s.

THERE are difficulties peculiar to the writing of histories of cases treated by psycho-analysis. The intimacies of the patient's life are so closely concerned that everything leading to identification must be withheld or disguised; no close record can be kept of the analytical findings; links in important chains are so scattered that to join them involves a re-setting of the material; and, finally, the full report of a single analysis would be too voluminous for publication. Pleading these and other difficulties, Freud makes here no attempt to produce conviction in the minds of sceptics, but writes for the information of investigators already convinced by their own experience. The first of the five cases described is one of typical hysteria showing dyspnoea, nervous cough, aphonia, and migraine, with depression and hysterical unsociability, and these commonplace symptoms

were bound up with an involved history of emotional events the description of which, with a running commentary, occupies over a hundred pages. The much criticised *Analysis of a Phobia in a five-year-old Boy* follows, with a postscript telling that both phobia and analysis were forgotten by the subject at the age of 19, when the account of his own case came to him as something novel and unknown. To the clinical psychologist the obsessional neuroses are, perhaps, the most interesting of the psycho-neuroses, though their presence is often unrecognised, since the obsessional patient, unlike the hysteric, tends to hide his symptoms from the world in general and his medical adviser in particular. Analyses of two cases are described and, even in their abridged form, they well indicate the complexities of the fantastic logic of the unconscious. More inferential is the application of psycho-analytical principles to elucidate the autobiography of a paranoiac.

The volumes of this series are in historical and logical sequence and should be read in their order of publication. The present one marks a stage at which the general reader can still cope with the difficulties of the subject, though it naturally appeals more to those engaged in treatment.

Problems of Personality. Studies presented to Dr. MORTON PRINCE. By Various Authors. London: The International Library of Psychology, Philosophy, and Scientific Method; Kegan Paul. New York: Harcourt, Brace and Co. 1925. Pp. 434. 18s.

Dr. Morton Prince is an American pioneer of psychopathology, best known by his studies of dissociated personality and by his views on the psychogenesis of epilepsy, and a bibliography at the end of this book enables one to trace the development of his interest in general medicine through neurology to the field of psychology and psychopathology. The contributors to this *Festschrift* write with authority in their own spheres, and within the one book the editors have brought together widely divergent views that in this case indicate the growing point of a vigorous branch of knowledge. In the list of writers of the 24 papers the names of Janet, Ernest Jones, Jung, and Putnam mark its international character, and we are reminded that while MacFie Campbell and William McDougall have left this country to take up academic posts at Harvard, the United States has given in exchange John T. MacCurdy to Cambridge University.

Problems of personality involve so many aspects of human behaviour that there is of necessity an absence of continuity of subject. Papers on witchcraft and on medico-legal experiences, on the signatures of Shakespeare, and on the association of psycho-neuroses with mental deficiency, find place under the title of "Abnormal Psychology and Psychopathology," and under the heading of "Unconscious Dynamics and Human Behaviour," Dr. Ely Jelliffe makes an important contribution to the study of unconscious processes in their relation to clinical conditions. Papers by Dr. Knight Dunlap and Dr. H. H. Goddard attack the concept of the unconscious, and Dr. McDougall vigorously criticises Freud's views on social psychology, whilst the psycho-analytical side is represented by MacCurdy and Ernest Jones. It is gratifying to find the psycho-analytical controversy handled upon a scientific plane.

The general reader may find it difficult to estimate the relative values of the views expressed in this book; the psychologically trained reader who feels more confident may bear in mind the warning of MacFie Campbell on page 74: "We are too much accustomed to think that there is only one correct way of dealing with experience, and that the angle, from which we personally come to experience, is the only one from which it can be approached." To both the general and the specialist reader the book can be recommended; it shows that we have travelled far since psychology was described as "the definition of the obvious in terms of the unintelligible."

OPHTHALMOLOGY.

Iris and Ciliary Body. Sémiologie Oculaire. Le Diaphragme Irido-ciliaire. By Prof. FELIX TERRIEN, Ophthalmic Surgeon, Beaujon Hospital, Paris. Paris: Masson et Cie. 1924. With 126 illustrations. Pp. 240. Fr.25.

WE have here the second part of a work planned on a generous scale to include not only the symptomatology, but the anatomy, physiology, pathology, and to a partial extent the treatment of the entire eye, details of operative treatment alone being excluded. The first part ("La Calotte Cornéo-sclérale") has already been reviewed in these columns,¹ and the remarks then made on the difficulties of considering separately the diseases of the various structures which make up the eye are equally applicable here. Nevertheless, an exhaustive study of the iris and ciliary body, such as this book gives, will be a valuable addition to any ophthalmological library.

In many places the book reflects views current in France and not in this country. Prof. Terrien retains the term rheumatic iritis, which in England has almost gone out of fashion, but he adds that perhaps many cases of rheumatic iritis should be attributed to a latent tuberculosis. In this country we are accustomed to think more of a latent gonorrhoea or of septic infection from the teeth. Tuberculosis of the uveal tract is well illustrated and on the subject of treatment we note that the author almost wholly rejects the use of tuberculin. When we employ tuberculin, he says, in doses so small as certainly to avoid any focal reaction, we deprive that substance of any therapeutic value. On the subject of sympathetic ophthalmia we miss any reference to the characteristic cells infiltrating the choroid described by Fuchs. The author considers favourably the idea that it is a local manifestation of anaphylaxis. In the section on glaucoma, which is included in this volume, the English reader will remark the small place allotted to perimetry as a method of diagnosis, and that in treatment by sclerectomy prominence is given to the method of Lagrange, not to that of Elliot. There are some interesting sections showing retinal atrophy caused by prolonged high tension.

The book is beautifully illustrated, more notable figures being a section of the ora serrata, showing the transition from the functional to the ciliary retina, a syphilitic granuloma at the root of the iris and sections showing the results of an experimental injection of gonococci into the anterior chamber, and demonstrating the beneficial effects of an injection of anti-gonococcal serum.

Medical Ophthalmology. Second edition. By R. FOSTER MOORE, O.B.E., F.R.C.S., Assistant Ophthalmic Surgeon, St. Bartholomew's Hospital; Surgeon, Moorfields Eye Hospital. London: J. and A. Churchill. 1925. With 8 plates and 93 illustrations. Pp. 344. 18s.

Mr. Foster Moore's book is considerably expanded since the publication of the first edition in 1922. The whole has been thoroughly revised and there are several new sections. Defect of the visual fields due to lesions of the temporal lobe is a comparatively new subject. There is a diagram showing how the ventral part of the optic radiations plunges first forwards from the external geniculate body into the temporal lobe and then backwards to the calcarine cortex. Intracranial aneurysms causing subarachnoid hæmorrhage are dealt with, and the various ocular symptoms thereby caused, including papillo-œdema and retinal hæmorrhages. Another addition is a section on juvenile and adolescent forms of cerebro-macular degeneration. One of the most interesting additions is a section on the Argyll Robertson pupil from causes other than syphilis. It is based on an original report of the author's on seven cases with Argyll Robertson

¹ THE LANCET, 1923, ii., 334.

pupils in whom most careful investigation failed to reveal any evidence of syphilis, or nervous or other disease of any kind. In certain cases it appears to be congenital and a quite isolated phenomenon. According to Kinnier Wilson, it is an occasional occurrence in diffuse toxi-infective states other than neuro-syphilis.

As in the first edition, the most interesting and original parts of this work appear to us to be those concerned with retinal arterio-sclerosis and renal and other forms of retinitis. These are especially well illustrated. We know of no other book where the relations between the ophthalmoscopic appearances and microscopic findings in these diseases can be so well studied.

LECTURES ON DISEASES OF CHILDREN.

Fifth edition. By ROBERT HUTCHISON, M.D., F.R.C.P., Physician, London Hospital, and Hospital for Sick Children, Great Ormond-street. London: Edward Arnold. 1925. Pp. 459. 21s.

THE fifth edition of Dr. Hutchison's lectures contains new material which adds considerably to the ground which they cover, while the individuality of the book has been preserved. Minor alterations have been made throughout the text, but the principal additions consist of five new lectures, dealing with acute rheumatic carditis, affections of the liver, the solitary child, abdominal pain, and disorders of growth and development. A new chapter is devoted to convulsions, which no longer appear among the functional disorders. New elements are introduced in the review of the ætiology of rickets. Dr. Hutchison has modified his view of the transmission of syphilis which he now regards as maternal and usually placental. In the treatment of tuberculous peritonitis he favours early surgical measures for all ascitic cases. The new lectures are characterised by the same lucid and homely style as the older ones. The lecture on the problem of the solitary child should be of particular value in directing attention to an aspect of children's disorders which is too commonly neglected.

The popularity of this book among students and practitioners will certainly be maintained by the new edition.

ORGANOTHERAPY.

Opothérapie Clinique; Organothérapie; Formulaire. By MARCEL LAEMMER. Paris: Masson et Cie. 1925. Pp. 151. Fr.10.

Opothérapie Endocrinienne. By GUY LAROCHE. Paris: Masson et Cie. 1925. Pp. 256. Fr.12.

THESE two books, so similar in title and appearance, are very different in content. Dr. Laemmer's book is that of an enthusiast, who is devoted, perhaps on account of some early successes, to treatment by glands and internal secretions, and who applies such treatment for all sorts of diseases. This enthusiasm carries himself and probably many of his patients to believe that material benefit is derived. To any doctor who thinks that bone-marrow, placenta, lung, breast tissue, given by mouth will improve his patient, this book will tell the dosage and method of giving. We cannot, however, avoid a suspicion that the doctor is more at the mercy of the manufacturer than Dr. Laemmer believes.

Dr. Laroche's book, on the other hand, while lacking enthusiasm, brings us in closer touch with modern ideas. It gives in fact a clear exposition of what is now generally believed. After some general remarks, the author gives a useful chapter on the methods of preparation used in making glandular products for medicinal purposes. He then takes each gland in turn, beginning with thyroid medication, and ending with insulin and polyglandular treatment. Each is discussed well and without bias, and the book sums up ably the present position of glandular treatment, or as the French prefer to call it, opotherapy.

DIABETES AND INSULIN.

Insulin. Darstellung, Chemie, Physiologie und Therapeutische Anwendung. Second edition. By Dr. H. STAUB, Privatdozent, 1 Assistent der Med. Klinik in Basel. Berlin: Julius Springer. 1925. Pp. 177.

IT is only a year since the first edition of this book was published and the necessity of a second edition, which is nearly double the size of the first, is a sign of the amount of new work which has been published as a result of the discovery of insulin. Dr. Staub gives a good account of the physiology of the diabetic condition and of the various efforts to discover the internal secretion of the pancreas, some of which only just missed success. The different methods of preparation of insulin are described, and the striking improvements in its manufacture are brought out. The known properties of insulin are enumerated, and the numerous experiments detailed which have helped to elucidate the problems. This part of the book will be valuable to other workers on this subject, since the arguments and experiments are fully discussed and abundant references are given. The clinical section of the book suffers a little by comparison, but mainly because the clinical problems are more difficult. The different methods of treatment are set out together with the ideals to be aimed at, and the indications and contra-indications found in practice. The absence of an index is to be regretted.

Die Insulinbehandlung bei Diabetes Mellitus. By Dr. H. STRAUSS and Dr. M. SIMON. Berlin: S. Karger. 1925. Pp. 74.

THIS is the third edition of a pamphlet which appeared two years ago. It opens with an adequate account of the discovery, properties, and manufacture of insulin, and then goes on to the description of its clinical usage. The authors do not use insulin in mild cases, regarding it as a luxury except in special circumstances. For the moderately and very severe cases they regard it as invaluable, although it has made the dietetic problem much more difficult. An account is given of the Hagedorn and Jensen method for estimation of blood-sugar, which is in many ways the most suitable for hospital work. The account of the theory of insulin action contained in the last 15 pages is too condensed to be clear.

Diabetes Mellitus and its Dietetic Treatment. Thirteenth edition. By B. D. BASU, Major I.M.S. (Ret.) Allahabad: Panini Office. 1925. Pp. 94. Rs.2.

THIS discursive little book contains details of diabetic cures with various carbohydrates. The short account of insulin which, as the preface states, has been embodied in the new edition consists of 15 lines and is hardly adequate. The fasting treatment is dismissed in four pages, and is followed by two pages on the cocoanut cure.

EVOLUTION, HEREDITY, AND VARIATION.

By D. WARD CUTLER, M.A., Chief Protozoologist to the Rothamsted Experimental Station, Harpenden. London: Christophers. 1925. Pp. 147. 4s.

THE importance of modern biology to medicine is not properly appreciated, and the medical implications of the subjects dealt with in this book have hardly begun to be explored. It must surely be as necessary that the ordinary medical student should know about Mendel and the normal curve of variation, as that he should be aware that salt is made up of sodium and chlorine. Medicine consists of individual cases, but medical science badly needs, as Mr. Yule reminded us lately, to think at least in terms of averages, better still in terms of distributions. Mr. Cutler has written quite a good introduction to evolution and heredity, and the publishers have made it available at a really

modest price. The historical part in which the evolution of Evolution is traced with interesting personal touches is particularly well done. Thereafter there is rather too much Mendelism and rather too little Galtonism. It may be true that continuous variations arise from a multiplicity of Mendelian factors. On the other hand it may not, and in any case the impossibility of subjecting characters beyond a certain degree of complexity to factorial analysis makes it difficult to be sure about it. There is still plenty of room for looking at the world in Prof. Karl Pearson's way, as well as in Professor Bateson's. But the book will serve as an excellent introduction to the subject, though pathologists will wonder what the author is talking about in the paragraph headed "Blood Tests" (p. 32). If it is meant to be a summary of Nuttall's work on precipitins, it is as strange a travesty as there ever was, and it suggests that, if it would do medical men good to know a little more about Mendel, it might do protozoologists good to know a little more about immunology.

CLINICAL PSYCHOLOGY.

By LOUIS E. BISCH, M.D., Ph.D. London: Baillière, Tindall and Cox; Baltimore: Williams and Wilkins Company. 1925. Pp. 346. 15s.

As its name implies, this book deals with methods of mental examination of patients suspected of sub-normality or abnormality. The author's scheme of examination is, as is usual with American investigators, elaborate in the extreme, pursuing every possible detail of personal, family, and social history, and including full inquiry into environmental conditions besides the actual personal interview and the use of intelligence and pedagogical tests. It is not suggested that one person should be responsible for all parts of the investigation, but the author is emphatic that the evaluator of the available data should be a medical expert with special training, an opinion which coincides with English practice, although the special training may still be somewhat less complete than is desirable. Most examiners will probably have to be content with a less comprehensive scheme than the book gives. It is fairly certain that much of the information asked for will be unobtainable or inaccurate, and it is also questionable if some of the details inquired into throw much light upon the mentality of the patient.

The rest of the book is essentially a text-book of mental deficiency, but special chapters are included on the epileptic, the syphilitic, and on functional conditions. On the whole the treatment is somewhat superficial: a chapter on the precocious child, which we should be disposed to welcome as a novel feature of such a book, is singularly unilluminating. A useful section distinguishes constitutional psychopathic states, including emotional instability, pathological lying and wandering, from amentia on one hand and insanity on the other. Here again we could have wished for fuller treatment. The author's attitude to the problem of the "moral imbecile" is that of most modern psychologists, who relegate it, rightly or wrongly, to the limbo of forgotten things. Heredity is cursorily dealt with, and it is surprising that, in a book in which Dr. A. F. Tredgold is so frequently quoted, his theories on this subject are completely ignored.

With regard to mental testing, the author advocates the use of certain performance tests, in addition to the Binet-Simon scale, in order to assess intelligence, and is careful to warn his readers that interpretation of tests is even more important than the actual results, a warning that is still necessary. A useful appendix gives complete descriptions of a large number of cases of all types, including some normals and super-normals in intelligence, well worth study by those who are commencing mental testing. The book contains a few good plates, which might have been increased in number, and are not well placed in the book.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

(Continued from p. 248.)

THURSDAY, JULY 23RD.

THE PATHOLOGICAL BASIS OF TREATMENT BY RADIATION.

THE discussion on this subject was opened by Prof. Sidney Russ, who said that the most important therapeutic use of radium and X rays was in the treatment of malignant disease, whilst surgical tuberculosis and the deficiency diseases were those most susceptible to light and ultra-violet therapy. In the laying down of the pathological foundations of such therapy it was necessary not only to specify the cellular changes resulting from irradiation, but also to correlate them with the dosage employed and to indicate the processes by which the changes are brought about. The degree to which visible and ultra-violet radiation penetrated the tissues was small; it became, in fact, gradually smaller and smaller as pigmentation due to this exposure increased, and there was a natural tendency to attribute the reactions which occurred to some effect set up either in the blood-stream or the lymph, or to suppose that the nervous system played some important though obscure part. The pathological basis of heliotherapy was not so well defined as that of treatment by X rays and radium. Pathological researches had shown that cellular degeneration was a frequent sequel to irradiation of tissues. These changes might be due either to a direct action of the radiation upon the internal constituents of the cell, or to a direct action of the radiation upon the interfaces of the cell, or to an indirect action which irradiation initiated. Prof. Russ said that he would like to hear these alternatives discussed—his own views inclining him to the opinion that some interfacial action plays the dominant part in the first instance. Considering the tissues as systems involving a continuous adjustment of their equilibrium, he thought that the upset of such equilibria was more likely to have a profound effect upon the composite mass than the actual breaking down of the chemical complexes within the cell. In tissue clearly damaged by radiation we had evidence of the whole equilibrium being upset. In tissue submitted to doses which had no visible effect whatever we had the equilibrium entirely conserved, as it was towards visible radiation, and in those cases where only slight visible effects were produced; yet with integrity of the structure we might perhaps look upon them as stable yet entirely new conditions of equilibrium. Various tissues responded differently to a dose of radiation according to whether the time of exposure was short, the quantity being large; or long, the quantity being small. It was still obscure why there should be a difference in the reaction of the tissues when the actual dose was constant, the only variation being in the conditions of exposure. The effects of radiation on the tissues were unique. In living tissues we were confronted with a complex continuously adjusting its equilibrium with contiguous or enveloping structures, and experimental methods would appear more likely to reach success if the complex were kept in mind without the effort of reducing it to simple terms.

Dr. T. S. P. Strangeways gave a description of the effect of irradiation by X rays on cells undergoing division in tissue cultures of the embryonic fowl and on the embryo while in the unopened shell. The effects were observed during experiments which are being carried on by himself and his co-workers, Dr. R. G. Canti, Dr. M. Donaldson, Prof. Hopwood, and Dr. F. G. Spear. These experiments indicated that even small doses had a pronounced inhibitory effect on cell division and that they prevented new

cells from coming into mitosis. Such small doses caused a definite retardation of the different phases of mitosis in those cells which had already begun to divide before the commencement of irradiation. It was found that there was no definite evidence that cells in actual mitosis were more vulnerable than those in a vegetative state. It was further found that, within the limits of the experiments, variation in the quality of the incident dose of X rays as measured by a Friedrich iontoquantimeter had no appreciable influence on the dose required to prevent mitosis.

Miss E. M. Hume read a paper on the

Action of Ultra-violet Light upon the Growth of Rats, in which she described experimental work which proved that light cannot substitute cod-liver oil indefinitely for the growth and well-being of the rat. Although calcification may be promoted by the light, yet the set of symptoms due to injury to the mucous membrane eventually display themselves and lead to a fatal issue. It appears that some reserve is gradually exhausted. Possibly this other limiting factor is the original vitamin A, though how far this is completely independent of the light or antirachitic factor cannot at present be determined. The nature of the antirachitic vitamin or of any inactive precursor substance is at present uncertain; it appears to be fat-soluble; but it is not even proved that there is one specific substance. Antirachitic properties have been conferred upon various inactive substances by exposing them to ultra-violet radiation, and when fed to rats they produce the same effect as does direct irradiation.

Dr. A. Piney spoke on changes in the blood and blood-forming organs following exposure to X rays. On the bone marrow the effects are essentially destructive in character, and are seen in the shape of nuclear degeneration of the essential cells, although there is no change in the adipose tissue. In the lymphatic glands the results of radiation resemble those due to inanition, but occur much more rapidly. The involution of the thymus resulting from X rays is rapid and extreme. The changes in the spleen are more difficult to interpret because considerable variations occur in response to different doses. Ziegler was able to show that, if the dosage were so adjusted as to injure the Malpighian bodies without damage to the pulp, it was possible to demonstrate the occurrence of myeloid metaplasia in the latter structure within a few days. In the blood the great majority of investigators have shown that there is a distinct reduction in the number of leucocytes, which depends mainly upon decrease of the neutrophils with consequent relative lymphocytosis. The basis of the changes occurring in the blood is still a matter of controversy.

Dr. R. G. Canti and Dr. F. G. Spear discussed the
Biological Action of Gamma Ray Irradiation on Tissue Cultures.

The experiments were undertaken as a result of certain observations on the effects of radium irradiation on cases of carcinoma of the cervix treated by Dr. Malcolm Donaldson. Most striking among these observations was the absence of mitosis which was observed as soon as the radium was removed after 24 hours in situ. The preliminary observations on tissue cultures were purely qualitative. Living cells were examined in the thermostat for prolonged periods under the microscope whilst under the influence of radium. The following conclusions had been reached: (1) Cells in mitosis divided in what appeared to be normal fashion and the daughter cells developed into full-sized apparently normal vegetative cells and did not again go into mitosis. (2) For a certain period, the length of which depended on the intensity of irradiation, cells continued to come into mitosis as before irradiation, but at the end of this period no more cells came into mitosis.

After satisfying themselves that radium irradiation brought about very definite changes in the cultures, they had undertaken quantitative experiments with

a view to determining whether the same amount of irradiated energy brought about the same biological effects irrespective of the time over which that energy was radiated—i.e., if the radium were moved further from the tissue culture to a distance whereby the incident intensity were halved, then would double the time be required to produce the same biological effect? The physical measurements of intensity of radiation at various distances were made by a photographic method, and curves were drawn up comparing the physical effects with the biological effects as determined by the time taken at various distances to cause cessation of mitosis. These curves showed that when the radium was near the tissue culture there was no observed departure from the physical readings, but that at a greater distance a longer time was required to bring about the same effect than would be anticipated from purely physical laws. Further, the shape of the biological curve suggested that beyond a certain critical distance from the radium no biological effect might be expected. It was pointed out that, at this stage of the investigation, this course of events could not necessarily be translated into conditions when radium is applied to carcinoma in vivo.

A paper was read by Dr. Helen Mackay on

Foodstuffs Irradiated with Ultra-violet Light

and their effect on the bone lesions of rachitic children. Dr. H. F. Shaw had collaborated in this work, and he showed a number of lantern slides of X ray photographs. Their experimental work led them to the conclusion that the effect of direct exposure to ultra-violet light on the bone lesions of a rachitic patient appear to be dependent upon the power of light to produce in certain substances the so-called antirachitic factor. Rapid healing of the bone lesions in children can be brought about by dried milk irradiated with ultra-violet light from the mercury arc, and this antirachitic potency of the milk withstands ten minutes' boiling. Three ounces daily of white flour similarly irradiated had little or no effect, and the antirachitic power of 6 drachms daily of irradiated cotton-seed oil is probably slight. There is reason to believe that a prolonged exposure to ultra-violet light will destroy the antirachitic potency a shorter exposure has imparted. It seems probable that the action of a foodstuff artificially rendered antirachitic by irradiation with ultra-violet light is identical with the action of a naturally occurring foodstuff containing the antirachitic factor, and that no more beneficial effect is to be expected from irradiating a patient's milk than from giving cod-liver oil. But when cod-liver oil cannot satisfactorily be given then irradiated substance may in the future prove of considerable value.

At the conclusion of this communication an opportunity was given for questions to be addressed to the readers of papers, and the following took part in the subsequent discussion: Dr. J. Barcroft Anderson, Dr. Braxton Hicks, and Prof. J. C. G. Ledingham.

FRIDAY, JULY 24TH.

THE PRESENT POSITION OF PATHOLOGY AND BACTERIOLOGY IN THIS COUNTRY WITH SPECIAL REFERENCE TO RESEARCH.

In opening a discussion on this subject the President of the Section, Prof. J. C. G. Ledingham, remarked that in the last annual report of the Medical Research Council the parts played respectively by physiology, pathology, bacteriology, biochemistry, and experimental medicine in contributing to the general advance of practical medicine in this country were discussed at considerable length. The report recorded praiseworthy progress in the fields of physiology, but found little to place to the credit of pathology and bacteriology during the last five years. This apparent sterility was attributed to the stated fact that the purely utilitarian side of pathology and bacteriology has lessened the opportunities of their exponents for contributing to the advance of new knowledge, and in some cases tended to withdraw from active

research life workers who might otherwise have added to knowledge. Those universities were criticised which maintain the departments of pathology and bacteriology from fees received for the routine performance of diagnosis tests made on behalf of outside bodies. Prof. Ledingham agreed with the report of the M.R.C. that these practices are liable to grave abuse, and that immediate reform is necessary in the best interests of pathology, but declared that the place which routine diagnosis takes in the training of the professional bacteriologist cannot be ignored. Routine diagnosis is an excellent training for research; but when the research stage is reached routine diagnosis should not be allowed to interfere with the new interests. The best pathological service can be realised only when ward and laboratory and patient or laboratory are brought as near as possible, and mutual consultation on equal footing can be arranged. The inspiration to research need not of necessity be subdued in the atmosphere of routine work; but the research output might be very considerably increased if the training of men for professional routine pathology and bacteriology were more carefully organised. Bacteriology must be recognised as a broad and fundamental branch of science, coördinate with, rather than subordinate to, the other great divisions of biology. Therefore the universities should train the graduate aspiring to become a professional bacteriologist by providing advanced instruction in general bacteriology. Though posts for bacteriologists have increased of recent years there appears to have been no corresponding increase in the field of suitable candidates. There are welcome signs that increased facilities for training pathology laboratory workers may soon be available. Prof. Ledingham passed on to consider the research institutes, which occupy a somewhat different, but not essentially different, position from that of the universities. Since all the ancillary sciences which minister to medicine are usually represented in the institute, the staff forms a self-contained unit. Experience has shown that pathology and bacteriology, research in serum-therapy and specific disease prevention, supply a constant stream of problems which may or may not have their immediate echo in practical medicine. Occasions arise, however, when the direct appeal to the human patient becomes insistent; and both the Pasteur and Rockefeller institutes have made provision for this by the establishment of research hospitals. At the Lister Institute, Prof. Ledingham remarked, a site is ready for a research hospital when the necessary funds can be obtained.

In spite of the handicaps under which these sciences labour in this country at present, how far is the criticism expressed in the M.R.C.'s report justified? Prof. Ledingham considered that the author of the M.R.C.'s report was unwise in attempting an estimate of the achievements over a short period of pathology and bacteriology as compared with those of physiology and biochemistry. He declared that some of the arguments advanced to support the points were founded on irrelevant or inaccurate statements, and he concluded an eloquent appeal for a less materialistic attitude with these words: "If bacteriology fails in five years to throw up an attractive flower, heaven knows that in the past 40 years it has thrown up many. Let it rest for a while in the apparent slumber of growth and rejuvenescence, working out anew its fundamental problems in activities which do not attract perchance the attention of the superficial observer."

Prof. M. J. Stewart (Leeds) said that he found himself fully in sympathy with Prof. Ledingham's point of view. He spoke in particular of the training of young pathologists, observing that this required the abundant supply of pathological material for their instruction. There was usually little difficulty in imparting to a promising laboratory worker sufficient skill to carry out routine work; but often he lacked that broad fundamental training in mathematics, physics, and chemistry which would enable him to tackle with success the great problems of

disease still awaiting solution. But facilities for better training were increasing. Thus the University of Leeds offers a four years' course leading to the degree of bachelor of science with honours in bacteriology. Within recent years there had been a revival of interest in morbid anatomy, and the prophecies of its decline had not been fulfilled. He thought that the study of morbid anatomy would be advanced if the teacher of histology approached the subject from the pathological point of view. Turning to the criticisms expressed in the last annual report of the Medical Research Council, he said he did not agree, among other points, with the wholesale ban on routine work therein pronounced. He pointed to an inconsistent attitude on the part of the author of the M.R.C.'s report to pathology and physiology. He concluded by entering a plea for a much maligned side of the pathologist's work—namely, "dead-room pathology"—and declared that the post-mortem room still provided an invaluable and almost inexhaustible field for original research.

Prof. Carl Browning (Glasgow) spoke particularly of the training of research workers, the facilities for research, and the endowment of research. After medical training he thought it to be of the greatest advantage to the pathologist to hold for several years a whole-time research fellowship. On the subject of facilities for research he considered it to be not excessive if every member of the staff of every pathological department had at least half of his working time free to devote to research work. He deplored the neglect of the facilities which exist at fever hospitals for the study of infectious disease, and appealed for a closer association of research in animal and human pathology.

Speaking of the endowment of research, he agreed that the M.R.C. had given almost inestimable assistance by paying both for personnel and material, but considered that endowments should be provided without the fettering condition of this being applied solely to the investigation of some particular specified problem or disease.

Dr. Braxton Hicks, Dr. J. A. Arkwright, Dr. C. C. Okell, and Dr. C. E. Dukes contributed to the discussion. In summing up, Prof. Ledingham said that he hoped that steps would be taken to bring the unanimous conclusions of the pathological section of the B.M.A. to the notice of all universities and hospitals of the country.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

SURGICAL INSTRUMENTS AND APPLIANCES.

THIS year sees the addition of much interesting surgical apparatus to the range shown in 1924.—[46] Allen and Hanburys, Ltd. (Bethnal Green, London, E.C. 2), showed various improvements in the St. Bartholomew's Hospital pattern operation table of last year, and a new horizontal model high-pressure steriliser, in addition to a wide range of instruments for general and special surgery.—[38] Arnold and Sons (John Bell and Croyden, Ltd., 50, Wigmore-street, London, W. 1): a new operation table fitted on double cylinder oil pump base and improved movement for raising and lowering the head and leg pieces, and a selection of surgeon's instruments made entirely of Firth's stainless silver steel. Their "Electrophonoide," an apparatus for re-educating the sense of hearing, was also being demonstrated.—[50] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1) showed a collection of surgical instruments and appliances.—[44] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C. 1) had a large collection of hospital furniture and instruments, including a new pedestal operation table, Cumberbatch and Robinson's diathermy electrodes, and the "Jupiter" sun lamp.—[43] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments and appliances, particularly the "Reavell-Moseley" electric rotary pump, for pressure and suction, which can be used to administer

anæsthetic vapours, to work sprays, evacuate cysts, or to remove blood and secretions from an operation area, thus saving much time in swabbing; also a complete set of instruments for per-oral endoscopy by Irwin Moore, so arranged that the tubes can be used for either proximal or terminal illumination; an artificial larynx by Tapier, and a selection of tubes for use after total laryngectomy; Hammond's combined urological syringe for local anæsthesia or hypodermic, intramuscular, or intravenous injection, for lumbar puncture, and for injecting the anterior and posterior urethra and the pelvis of the kidney; also the "Chiron" ring pessaries.—[40] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): a complete display of general surgical instruments, including the Vaquez-Lanbry sphygmotensiophone; Ryall's cysto-urethroscope and combined cystoscopic lithotrite; Sinclair's intracapsular forceps and outfit, and a projection and operation lamp suitable for any voltage, with water-filter attachment for demonstrating microscopic slides.—[41] Hoskins and Sewell, Ltd. (Bordesley, Birmingham): an obstetric bed designed by Dr. Remington Hobbs for drainage treatment. This is made in separate halves, each having four legs and wheels; the foot end can be pulled away and stirrups put in the other half, minimising disturbance of the patient; a number of patent wheeling bedsteads particularly adapted to the open-air treatment of tuberculosis; the Alton sunshade for the head and shoulders of a patient receiving sun treatment.

Among the special instruments:—[2] G. H. Zeal, Ltd. (75, St. John-street, London, E.C. 1): the "Repello" clinical thermometer, which is reset by pressing a top bulb and requires no shaking. The "Acello re-setting" clinical thermometer case, for those who find it difficult to shake the ordinary thermometer; and an aseptic thermometer with graduations on the glass outer case and an unmarked stem, which is unharmed by any antiseptic solution.—[12] Theodore Hamblin, Ltd. (15, Wigmore-street, London, W. 1): a collection of ophthalmic instruments and equipment, including the new Lister hand-projection lamp for operating; a new luminous Morton ophthalmoscope for use with direct and indirect methods; a new astigmatic test with grey background and an improved form of the Lister perimeter and scotometer. They had also on view a series of drawings and lantern slides of eye conditions, made by their staff of trained draughtsmen.—[13] The Genito-Urinary Manufacturing Co., Ltd. (64, Great Portland-street, London, W. 1): a selection of all the latest instruments of bladder and kidney surgery, and particularly a series of diagnostic instruments not previously manufactured in this country.—[29] The British Hanovia Quartz Lamp Co., Ltd. (Slough): their quartz mercury anode type lamps, for direct current and alternating current without rectification.—[30] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1), showed an improved pattern of the Sunrae carbon arc lamp for ultra-violet radiation; an improved bed and lighter local appliances, and a bed-warmer fed from the house supply.—[31] Rayner and Keeler, Ltd. (Kemp Town, Brighton): various operating lamps and ophthalmoscopes, particularly a triple-beam operating lamp minimising shadow, an adjustable ophthalmic bracket fixed above the patient's head, and a slit-lamp with single focus for microscope and lamp; also Dr. R. Wallace Henry's new light perception instrument which was demonstrated at the Sectional Meeting.—[33] Hague and Son (32, Broad-street, Bath): ophthalmic instruments, including the Zeiss simplified Gullstrand ophthalmoscope and the Zeiss parallax refractometer, embodying slit-lamp and ophthalmoscope.—[45] The Inhaling Drug and Apparatus Co. (30, Grosvenor-place, London, S.W. 1): the Apne inhaler apparatus (Spiess Drager), which transforms any liquid into an infinitely fine vapour for inhalation. Drugs, including insulin, may be administered through the respiratory organs by this means, reaching the circulation more rapidly than by hypo-

dermic injection.—[52] H. E. Curtis and Son, Ltd. (7, Mandeville-place, London, W. 1): a series of abdominal supports and colostomy trusses, and a medicinal liquid paraffin "Colonol."—[62] General Acoustics, Ltd. (77, Wigmore-street, London, W. 1): the latest aids for the deaf, electrical and non-electrical, including a new microphone encased in light imitation tortoise-shell, giving a mellower sound; and a special theatre-box that enables the deaf to hear loud speakers as well as plays, speeches, and sermons.—[86] Ardente-Acoustique (95, Wigmore-street, London, W. 1): the new 1925 types, a distinct advancement on previous models with complete freedom from metallic or extraneous sounds.—[69] Pedestros, Ltd. (10, Conduit-street, London, W. 1): "Desoutter" light metal artificial legs for all types of amputation.—[84] B. Smith (6, Cambridge-terrace, Widcombe Hill, Bath): a series of adjustable aluminium limbs, splints, and calipers for bone-grafting, &c., with special apparatus for rapid lengthening and shortening; also a showcase of photographs of wounded men fitted with artificial limbs and appliances at the Bath War and Ministry of Pensions Hospital, 1915-22.

Other firms supplying surgical dressings:—[7] Antiphlogistine (Denver Chemical Manufacturing Co., London, E.C. 3) and [5] The Thermogene Co., Ltd. (Haywards Heath, Sussex) were demonstrating their well-known products.—[4] Fassett and Johnson, Ltd., were showing a full range of Seabury and Johnson plasters, dressings, and surgical requisites, including Mead's rubber adhesive plaster and the "Gold Cross" absorbent cotton.—[16] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C. 3): various preparations of cyllin, an antiseptic which has a Rideal-Walker coefficient for *B. typhosus*, 24-26.—[37] The Jaeger Co., Ltd. (95, Milton-street, London, E.C. 2): a selection of underwear and outerwear for men, women and children; also the "Domen" belts for pregnancy, hernia, and floating kidneys.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

[46] Allen and Hanburys (37, Lombard-street, London, E.C. 3): in addition to the well-known "Byno" and "Polyglandin" preparations, the "A. B" brand of insulin, "Osmo" Kaolin, a specially purified colloidal kaolin, prepared by electro-osmosis and used in the treatment of intestinal toxæmias; "Sea-cones," suppositories containing chloral hydrate and bromide, for sea-sickness; "Iodolysin," a soluble compound of thiosinamin, containing 47 per cent. of iodine; a diabetic flour; and surgical Pitibulin, double the strength of the obstetrical Pitibulin, for surgical shock. "Antivirus" is a series of specific local immunisers prepared from the broth culture in which bacteria have been grown.—[47] Boots Pure Drug Co., Ltd. (Station-street, Nottingham): a representative display of the firm's special medical products, fine chemicals, medicated capsules, and compressed tablets; gonococcal vaccines made at St. Thomas's Hospital; capsules of hexyl resorcinol, a new intestinal antiseptic, and a full range of the antivenereal preparations "Stabilarsan," "Bismostab," "Thiostab," "Acriflavine," and "Chloramine-T." The "Alpine" sun lamp was demonstrated in the local branch.—[83] C. J. Hewlett and Son, Ltd. (35-42, Charlotte-street, and 83-85, Curtain-road, London, E.C. 3): a number of original preparations, including Mist. Pepsinæ Co. e. Bismutho; Mist. Hepatica Conc.; an antiseptic cream; "Somnigen," a preparation of opium free from disagreeable odour, taste, and after-effects; "Veronigen," a liquid preparation of barbitone; "Hormonigen," a compressed pluriglandular tablet, and Dr. Crofton's human tubercle bacillus solution.—[64] The Hoffmann-La Roche Chemical Works, Ltd. (7, 8, Idol-lane, London, E.C. 3): besides the well-known "Omno-pon," "Sedobrol," and "Spasmalgin," "Allonal" a non-narcotic analgesic; chocolate iodostearin tablets used in the prophylaxis and treatment of simple goitre in school-children, and "Digalen" amorphous digitoxin, a chemically standardised and physio-

logically controlled preparation of digitalis, free from inactive and toxic constituents.—[78, 79] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): in addition to the various palatinoids, bipalatinoids and "Roboleine"; an aeriser for reducing all liquids to a fine invisible smoke for the treatment of affections of the respiratory tract; "Balmosa," an analgesic antiseptic cream; and "Pinheroin," containing terpene hydrate and heroin hydrochlor. with essence of Canadian pine.—[11] Parke, Davis and Co. (50, Beak-street, London, W. 1): a series of pharmaceutical preparations, including "Dibromin," a crystalline germicide containing about 56 per cent. of bromine; "Metagen," a concentrated vitamin preparation and "Metagen" combined with cod-liver oil; a 1 per cent. solution of silver nitrate in wax capsules to instil into the eye of the new-born baby; and a selection from the series of vaccines prepared at St. Mary's Hospital.—[51] Burroughs Wellcome and Co., Ltd. (Snow Hill Buildings, London, E.C. 1): amongst additions to the list of "Tabloid" products: "Tabloid" digitalis leaf, presenting the whole substance and activity of selected digitalis leaves; "Tabloid" hexamine and "Tabloid" methylene blue; "Kharsulphan," a new antisyphilitic for hypodermic or intramuscular injection; "Hypoloid" bismuth metal suspended in isotonic glucose solution; a demonstration of the stages in preparation of "Tabloid" thyroid gland and "Wellcome" insulin; "Tabloid" iodicin, gr. 3, for adults and with chocolate base for children; and a series of vaccines and sera.—[67] Burgoyne, Burbidges and Co., Ltd. (East Ham, London, E. 6): a collection of pharmaceutical preparations, including Cooper's colloids; "Chlorobrome" for insomnia and sea-sickness; "Neutramyne" tablets of cod-liver oil, and ethyl chaulmoograte sodium morrhuate for leprosy.—[68] Ferris and Co., Ltd. (Bristol): pharmaceutical specialties, including Elixir parathyroid and calcium lactate; Elixir "Vi-glandin," a preparation of thyroid, pituitary, orchitic and ovarian substance in combination with the glycerophosphates of calcium, iron, sodium, potassium, and magnesium; "Otoids"; "Sterisols," for hypodermic injection; surgical instruments and dressings and scientific apparatus.—[77] Lionel Cooper (14, Henrietta-street, London, W.C. 2): various drugs, including "Milesia," a soluble tablet containing gr. 3 magnesium hydrate, plain or flavoured with peppermint; "Presoioid," an iodine solution prepared from the formula of Prof. Pregl, plain, concentrated or pepsinated; "Salvitæ," a uric acid solvent in granular form; and "Sil-Al," a physiologically pure silicate of aluminium in the form of a white tasteless powder which forms a colloidal suspension when mixed with water.

Special pharmaceutical preparations were shown by [6] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): the well-known effervescent saline laxative.—[8] Crookes' Collosols (The Crookes Laboratories, 22, Chenies-street, London, W.C. 1): the wide range of "Collosol" drugs, among the latest additions being "Collosol Lactalumina," an antacid; "Collosol Ichthyol," a British preparation; "Collosol Kaolin"; also a "Collosol Kataplasma Iodo-kaolin" for use as a poultice in inflammatory conditions.—[26] W. Dederich, Ltd. (Stanley House, Dean Stanley-street, London, S.W. 1): the original "Ichthyol" sulphonated schist oil preparation; "Pantosept" tablets, which when dissolved in water produce a solution of hypochlorous acid for antiseptic purposes. This firm is also the agent for the preparations of J. D. Riedel, A.G., Berlin, whose "Noctal," a soporific without disagreeable after-effects, deserves mention.—[36] The Semprolin Co., Ltd. (18, Leather-lane, London, E.C. 1): the various combinations of "Semprolin" emulsion of paraffin oil; the plain oil which may be prescribed with anything the practitioner desires; the emulsion with phenolphthalein; with guaiacol carbonate; with salol; and with bismuth and pepsin. Also "Carmex," the

mild laxative and corrective for children.—[49] Armour and Co. (Queen's House, Kingsway, London, W.C. 2): a series of endocrine preparations in tablet, capsule, powder, hypodermic, and liquid form. The ovarian and corpus luteum preparations are now standardised as well as the pituitary.—[54] Genatosen, Ltd. (Loughborough, Leicestershire): in addition to their well-known "Sanatogen," "Formamint," "Genasprin," and detoxicated vaccines; "Nasmint," a germicidal snuff; and a particularly pure and stable calf lymph.—[57] A. and M. Zimmermann, Ltd. (3, Lloyd's-avenue, London, E.C. 3): several specialties from the Schering laboratories, including the hypnotic "Medinal"; "Atophan"; "Atophanyl," a solution of the sodium salts of "Atophan" and aspirin with novocaine; "Arcanol," a combination of "Atophan" and aspirin used for influenza; "Veramon," a powerful non-habit-forming analgesic.—[63] Deshell Laboratories, Ltd. (150, Southampton-row, London, W.C. 1): "Petrolagar," a compound of agar-agar with paraffin oil in its four forms: plain, with phenolphthalein, without sugar for diabetic cases, and with alkali for hyperacidity and the constipation of pregnancy.—[72] The Anglo-American Oil Co., Ltd. (Albert-street, London, N.W. 1): the well-known "Nujol" liquid paraffin; and "Mistol," a combination of menthol, camphor, and eucalyptol with paraffin; also "Cream of Nujol with Agar," and a new insecticide spray "Flit."—[80] J. W. Carnrick and Co. (40, Lexington-street, London, W. 1): various pluriglandular formulæ, including the well-known "Hormotone" and "Trypsogen"; also "Erythrogen," a bone-marrow preparation for anæmia; and "Rhythmmin," a peristaltic stimulant.—[15] The British Dye-Stuffs Corporation, Ltd. (70, Spring-gardens, Manchester): the drugs S.U.M. 36 and S.U.P. 36; the arseno-benzine preparations for intravenous or intramuscular injection in gonorrhœa and inflammatory conditions.

Among toilet preparations:—[48] "Pepsodent," the pioneer acid dentifrice, and [56] Kolynos Inc. (Chenies-street, London, W.C. 1) demonstrated their dental creams.

FOOD PRODUCTS.

[18] Brooks and Warburton, Ltd. (40-42, Lexington-street, London, W. 1): the various Mead's infant diet materials, including "Dextri-Maltose," for use in all cases where sugar is needed; "Re-Co-Lac," a reconstructed milk powder; and certified Newfound-land cod-liver oil, a biologically tested and standardised preparation.—[23] Thew, Hooker and Gilbey, Ltd. (Buckingham): Hooker's Malted Milk, and "Lacta," an evaporated milk for infant feeding.—[34] Benger's Food, Ltd. (Manchester): the various products of the company, including peptonising powders, peptonised beef, and chicken jellies and lentil flour; illustrated by photographic slides showing the action of an artificial gastric juice on milk and milk mixtures.—[35] Montgomerie and Co., Ltd. (Ibros, Glasgow), the proprietors of Bermaline bread: two new brands of infant and invalid food, "Berina" food for children up to 6 months, and "Berina" Malted Milk for older patients.—[39] Trufood, Ltd. (Lever House, Blackfriars, E.C. 4): "Trufood Full Cream Milk," a full cream Cheshire dairy milk in powder form; "Secway," whey in powdered form for delicate and premature infants; and "Humanised Trufood," which essentially agrees in its composition with breast milk.—[59] Virol, Ltd. (Hanger-lane, Ealing, London, W. 5): the well-known "Virol," a composition of marrow-fat, glycerine extract of red bone-marrow, malt extract, eggs, lemon syrup and salts of lime and iron; "Virolax," an emulsion of Virol with 60 per cent. liquid paraffin; and "Virol and Milk," a tonic food for invalids, nursing mothers, and athletes.—[61] Cadbury Bros., Ltd. (Bournville): cocoa and chocolate.—[66] Ambrosia, Ltd. (Huntley and Palmer, Ltd., Reading): "Ambrosia Devonshire Milk" for infants and invalids; "Ambrosia Cocoa and Milk," a nutritious food for growing children and nursing mothers.—[70] Glaxo, Ltd. (56, Osn-

burgh-street, London, N.W. 1): in addition to "Glaxo" full cream, three-quarter cream, half cream, and malted food, "Prescription Glaxo," a dried milk powder giving percentages closely approximating to breast milk; "Glax-Ovo," a combination of milk, malt, and cocoa with ostelin; and "Ostelin," a high concentration of the antirachitic unsaponifiable fraction of cod-liver oil, three drops being equivalent to 1 drachm of the original oil.—[81] Oxo, Ltd. (Thames House, Queen-street-place, London, E.C. 4): besides "Oxo," the peptonised and unseasoned hospital "Oxo"; Lemco unseasoned beef extract; the various "Oxoid" endocrine preparations in tablet and food extract forms, of which the latest is "Pitoxilin," a sterile and protein-free solution of the purified oxytocic and pressor substances from the posterior lobe of the pituitary, supplied in a 10 per cent. obstetrical and general extract and a 20 per cent. surgical extract.

MEDICINAL AND MINERAL WATERS AND SPAS.

[20] Ingram and Royle, Ltd. (45, Belvedere-road, London, S.E. 1): the bottled Vichy-Célestins, Contrexeville, and Hunyadi János waters.—[17] Harrogate: This spa is particularly active in scientific work. All the continental methods of treatment are available in addition to several original methods. An entirely new apparatus has been installed in the throat and nose department and many long-standing nasal troubles have yielded to the administration of the waters in an atomised condition. A special bathroom has been equipped with laboratory and clinical apparatus, and is used solely for balneological research. A permanent scientific officer and analyst has been appointed, and the attendants are fully certificated.—[65] Buxton: Attractive booklets, setting out the value of radio-active thermal water at 82° F. and the chalybeate spring. The baths contain swimming pools and immersion baths, in all of which the water is continually running from the springs. The attendants are specially trained and examined by medical men for their certificate.—[60] Droitwich, which is developing its technical work and considering the establishment of an electro-medical section. The brine content of the waters is considerably higher than that of any other European mineral springs. The social amenities are very complete, and include tennis and croquet lawns and a golf course, photographs of which were on view.—[42] Gaymer's Cider (Attleborough, Norfolk) were demonstrating for their twenty-eighth consecutive year an assortment of their various brands, of which their dry ciders have gained widespread medical approval.—[19] Alexander Riddle and Co., Ltd. (Bancroft-road, London): Stoewer's lime-juice and lemon-juice preparations, made from selected fruit and refined sugar, without artificial colouring, essence or acid, containing vitamin C.

MICROSCOPES AND SCIENTIFIC APPARATUS.

[3] The Tintometer, Limited (The Colour Laboratories, Salisbury): a variety of pathological apparatus, particularly the "Red Cell Suspensionometer" of Dr. H. St. Amand Agate for the Wassermann test; and an improved form of Oliver's hæmoglobinometer.—[15] The British Dye-Stuffs Corporation, Ltd. (Manchester): a range of indicators for pH values; microscopic stains, specially tested pathologically and chemically; and chemical reagents.—[24] O. Sichel and Co., Ltd. (52, Bunhill-row, London, E.C. 1): the "Kinograph," an apparatus suitable for photographing living subjects and pathological specimens—it will do every photographic process, including enlarging and reducing from X ray negatives, and the very high-powered and steady illumination employed gives perfect control over exposures; also the "Eco-Dry" cabinet, heated by electricity, for the rapid drying of X ray and other negatives.—[28] British Drug Houses, Ltd. (16-30, Graham-street, London, N. 1): the "B.D.H. Capillator," a series of sealed capillary tubes filled with buffer solutions containing indicator, which give very

accurate pH indications with the use of a minimum of fluid; the "B.D.H. Comparator" case for storing sealed buffer tubes; the "B.D.H. Universal Indicator," showing the whole range of spectrum colours over a wide pH range; and the "B.D.H." histologically standardised microscopic stains.—[32] Messrs. Chas. Hearson and Co., Ltd. (68, Willow-walk, London, S.E. 1): several models of the well-known Reichert microscopes, for which they are sole agents; a spectroscopic eye-piece by Reichert; the dark ground illuminator of Prof. Arzt; a high-speed centrifuge giving 3000-10,000 revolutions per minute, suitable for the separation of ultra-microscopic viruses; and "Cornie's Half-Shadow Saccharimeter" for estimating grape-sugar and albumin in urine.—[53] Short and Mason, Ltd. (Atlantic House, 45-50, Holborn Viaduct, London, E.C. 1): the "Tycos" sphygmomanometers, portable and surgery types; also clinical and recording thermometers; and the "Micro-Barograph," a very sensitive recording barometer.—[76] Baird and Tatlock, Ltd. (14-15, Cross-street, Hatton-garden, London, E.C. 1): a series of autoclaves, centrifuges and other bacteriological apparatus; fittings of all kinds for hospital and public health laboratories; and apparatus for blood-sugar estimation.—[14] Eastman (Kingsway, London, W.C. 1): a series of "Dupli-Tized" X ray film negatives, with reductions and enlargements, showing the legibility and uniformity of the image; apparatus for simplified methods of development.

MEDICAL AGENCIES.

[9] The Medical Insurance Agency (429, Strand, London, W.C. 2), in addition to their usual literature, had a typical doctor's car for demonstration, supplied by Mann, Egerton and Co., and a qualified engineer to advise on car questions.—[73] The Medical Sick-ness, Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1): demonstrations of various policies, including their "Every Contingency" Sick-ness, Accident and Endowment Policy; and the "Perfect" Educational Assurance policy.—[38] Arnold and Sons (50-52, Wigmore-street, London, W. 1): a medical transfer department for practices and locum-tenents.

BOOKS.

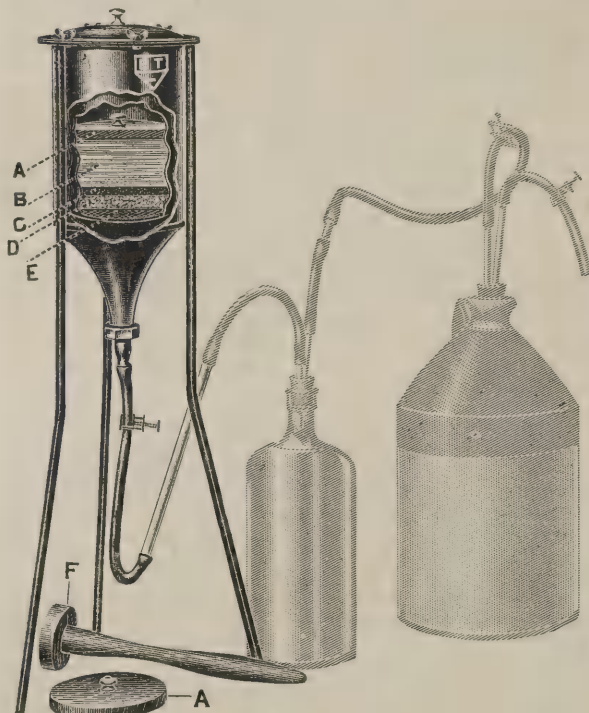
[1] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): a collection of the latest publications of Messrs. F. A. Davis Co., Philadelphia; E. and S. Livingstone, Edinburgh; and Cassell's, London, including Hay's Diseases of the Ear, Nose and Throat; Sajous' Analytical Cyclopædia of Practical Medicine; Russell's "Ultra-Violet Radiation," and McKendrick and Whittaker's "X Ray Atlas"; and the "Practical Medicine Series of Year Books."—[21] H. K. Lewis and Co., Ltd. (136-140, Gower-street, London, W.C. 1): a selection of their publications, including L. R. Fifield's "Minor Surgery"; E. A. Barton's "Essentials of Infant Feeding"; B. Burnett Ham's "Synoptic Chart of Skin Diseases," and the second edition of W. Ironside Bruce's "System of Radiography"; the *Clinical Journal*; and a selection of card index systems, ledgers, case sheets, &c.—[58] Constable and Co., Ltd. (10-12, Orange-street, London, W.C. 2): a selection of publications, including a "Modern Methods" series; and "Towards Moral Bankruptcy," by Bureau.—[71] W. B. Saunders Co., Ltd. (9, Henrietta-street, London, W.C. 2): a number of standard works in all branches of medicine.—[75] John Wright and Sons, Ltd. (Bristol): the "Medical Annual"; the *Journal of Surgery*; new editions of many well-known hand-books; and various systems of bookkeeping.—[82] J. and A. Churchill (7, Great Marlborough-street, London, W. 1), celebrating their centenary this year, showed a number of new and standard works, including Beaumont and Dodds's "Recent Advances in Medicine"; Goulden's "Refraction of the Eye"; Jackson's "The Effects of Inanition and Malnutrition upon Growth and Structure"; and Kobay's "Slit Lamp Microscopy of the Living Eye."—[85] The Oxford University Press (Amen House, Warwick-

square, London, E.C. 4): text-books on medical, surgical and allied subjects, including Price's "Medicine"; Leonard Williams's "Middle Age and Old Age"; Cope's "Clinical Researches in Acute Abdominal Disease"; and Taylor's "Neurological Fragments," by J. Hughlings Jackson.—[10] The Food Education Society (24, Tufton-street, London, S.W. 1) showed a series of pamphlets and books on food, cookery, and hygiene, including "The Gateway to Health"; "Rearing an Imperial Race"; "Facts for Patriots"; and "Puddings and Porridge."

New Inventions.

A NEW FILTER-PAPER PULP-HOLDER.

FOR several years one of us has used filter-paper pulp in an improvised holder for the purpose of filtering culture media and other fluids with invariable success. The chief feature of this pulp-holder is that as much as possible of the under surface of the pulp should be free for the passage of the filtered



material. We have now devised the holder here illustrated designed to simplify the preparation of the filter.

1. For a filter of 6 in. diameter 4 oz. of dry filter-paper pulp is broken up in about two litres of water. It is then reduced to a state of very fine division by the hands or with a whisk.
2. Pour the prepared pulp into the filter-holder and allow the superfluous water to drain away.
3. Connect to the exhaust pump and filter bottle. Exhaust gently, in the meanwhile pressing the pulp down firmly and evenly with the rammer (F) until no more water is drawn through.
4. Cover the pulp (D) with about 1 in. of washed sand (C).
5. Place the float (A) on the sand. The float is of service because fluids poured on to it do not disturb the surface of the sand.
6. Draw through about a pint of water (hot water if jellies are to be filtered) to clear away any fragments of pulp which may have escaped through the gauge (E). When the water reaches the surface of the sand, clamp the tube connecting the filter with the exhaust pump.
7. Dis-

connect the filter bottle or flask, empty the bottle, and reconnect it to the filter. The filter is now ready for use. The procedure should not take longer than 10 to 15 minutes.

Procedure for Filtering.—1. Pour the fluid to be filtered on the float until the filter is full. If a jelly is to be filtered replace the remainder in the steamer until there is room in the filter. 2. Connect exhaust bottle by unscrewing clamp and exhaust gently. The water which was held in the pulp will come through first. By observing the glass connexion the filtrate can easily be seen to follow the water which was held in the pulp. At this point clamp off, empty filter bottle, reconnect, and exhaust again gently.

With a properly made filter, 5 to 6 litres of agar can be filtered in half an hour without the addition of egg albumin. By preparing the filter with two layers of pulp and sand alternately bacterially contaminated fluids or broth cultures can be freed of at least 90 per cent. of bacteria. When such fluids have to be passed through a germ-proof filter, a preliminary passage through a pulp filter represents a great saving of time and of filter candles.

Messrs. Baird and Tatlock have made the pulp-holder for us.

Orpington.

E. T. THOMPSON.
E. CHARD.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. J. S. McGrath and Surg. Lt. H. C. C. Veitch are placed on Retd. List.

ROYAL NAVAL VOLUNTEER RESERVE.

The King has approved of the award of the Royal Naval Volunteer Reserve Officers' Decoration to Lt.-Comdr. E. Elgood.

Proby. Surg. Sub-Lt. H. O'Connor to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. G. O. Chambers retires, receiving a gratuity, and is granted the rank of Lt.-Col.

The undermentioned Majrs. retire on ret. pay:—E. L. Moss and E. G. Anthonisz, and are granted the rank of Lt.-Col.; M. Keane and G. H. Rees.

The undermentioned from Reg. Army Res. of Off. to be temp. Capts.: Lt.-Col. W. Owen-Prichard (and relinquishes the rank of Lt.-Col.), and Capt. S. Pinion (and relinquishes the rank of Capt.).

RESERVE OF OFFICERS.

Capt. A. G. Henderson, late temp. Capt., R.A.M.C., to be Lt.

MILITIA.

Capt. T. W. E. Elliott to be Maj.

TERRITORIAL ARMY.

C. E. Fenton to be Lt.

Capt. A. F. L. Shields (late R.A.M.C. Militia), H. F. W. Adams (late R.A.M.C.) and J. P. J. Jenkins (late R.A.M.C., Special Reserve) to be Capts.

2nd Lt. T. A. S. Samuel (late 15th Lond. R.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. A. E. Henton relinquishes his temporary commission on ceasing to be employed and is permitted to retain his rank.

The undermentioned Capts., Army Dental Corps, are granted temporary commissions as Flight Lts. on attachment for four years' duty with the R.A.F.: M. J. O'Reilly, S. A. McCormack, and P. P. Hogan.

The undermentioned Flight Lts. (Capts., Army Dental Corps) relinquish their temporary commissions on return to Army duty: G. F. Charles, L. Somerville-Woodiwis, and J. H. W. Fitzgerald.

THE LANCET.

LONDON: SATURDAY, AUGUST 8, 1925.

NEW LIGHT ON MUSCLE TONE.

A NOTEWORTHY feature of the study of diseases of the nervous system in recent years has been a return to more purely clinical and physiological methods of approach. This tendency is well seen in Dr. KINNIER WILSON's Croonian lectures on Some Disorders of Motility and Muscle Tone with Special Reference to the Corpus Striatum, of which the final instalment now appears in our columns. The Croonian lecturer is to be warmly congratulated on his survey of an admittedly intricate neurological problem; the space demanded for its elaboration was warranted by its practically helpful nature. It is no exaggeration to say that 20 years ago our knowledge of the functions and diseases of the corpus striatum was almost negligible, while our conceptions of disorders of motility in general and of muscle tone in particular were strictly limited. Since then an enormous amount of investigation, both clinical and pathological, has taken place, amongst which the original work of Dr. WILSON himself in identifying the syndrome now known as progressive lenticular degeneration (Wilson's disease) with disease of the corpus striatum must always hold a high place of merit. No one indeed is more fitted than he to throw light on the darkness of the general knowledge of this subject. But speculation and hypothesis have much exceeded ascertained facts in this as in other departments of medicine, and the student may well be disconcerted at the confusing nomenclature and theories which have been adumbrated. The various types and the sequelæ of epidemic encephalitis have, as is well known, added largely to the group of conditions in which disorders of motility and of muscle tone are commonly seen and attributed to striatal disease. The frequency in particular of the Parkinsonian syndrome as a sequel of this disease has provided opportunities of study of which Dr. WILSON has availed himself very fully.

Dr. WILSON's careful analysis of the symptoms of striatal disease as exemplified in the Parkinsonian syndrome may be compared with Prof. CRUCHET's University of London lecture, published in this issue, on the Relation of Paralysis Agitans to the Parkinsonian Syndrome of Epidemic Encephalitis. In many respects their opinions differ, as will presently be shown. The "paralysis," to use a general term, present in the Parkinsonian syndrome is considered to comprise three factors: (1) A relative motor weakness, most marked in those muscles whose mass is small; (2) a slowness of movement; and (3) a poverty of movements. The term "akinesia" is used to embrace these three symptoms, and the suggestion is made that part at least of this akinesia arises from an unwillingness to move, since in this disease movements require an unusual effort. One of the symptoms generally described as occurring in the Parkinsonian state is a loss or diminution of the so-called "associated" or "automatic" movements. Such movements Dr. WILSON prefers to call movements of coöperation, and he is at pains to show first that these sorts of movements are not in reality lost, and, secondly, that

to argue from their supposed absence the existence of a centre for such movements in the corpus striatum is a fundamental mistake. With his opinion on this point we are in entire agreement. The general opinion that there is an increase in muscle tone in these disorders is upheld by the lecturer, though the relation between the increase in tone and the loss of movements is not constant. We cannot here follow the lecturer in all his arguments, but the reader will note with interest that Dr. WILSON disagrees profoundly with HUNTER's recent conclusions as to the existence of a condition of plastic tone in the Parkinsonian state. Involuntary movements of different kinds are usually held to hold a place in the symptomatology of diseases of the corpus striatum. The principle laid down by HUGHLINGS JACKSON is recalled that positive symptoms, such as involuntary movements or tremor, cannot be directly caused by a purely destructive lesion. Such symptoms may be due to irritation or they may constitute what is now known as a "release phenomenon"—that is, the incoördinated or unqualified action of certain neural mechanisms when released from the normal control of the mechanisms which have been destroyed. The problem, therefore, is, as Dr. WILSON suggests, not what mechanisms are paralysed but what are active. Regarding the involuntary movements of chorea, Dr. WILSON has made the interesting observation that in many cases he found an interruption of the normal reciprocal innervation of muscles. He considers that a relative integrity of the pyramidal or cortico-spinal tracts is essential for the appearance of true choreiform movements, an opinion which receives strong support from the established clinical fact that the greater the amount of paralysis in chorea ("limp chorea") the less is the amount of movement present. No sharp distinction can be drawn between the movements of chorea and those of athetosis, and it is natural to postulate a similar cause for the two conditions. Dr. WILSON's arguments lead to the view that both chorea and athetosis have their origin in some afferent disorder of regulation, attributable to lesions of the cerebello-mesencephalo-thalamo-cortical path, from which conclusion the conception of an involuntary cortical motor activity follows.

The pathogenesis of tremor has long been a matter of dispute. Few probably will gainsay the view that it must be regarded as a release phenomenon of some kind. In Dr. WILSON's view it differs fundamentally from chorea and athetosis, if only because in tremor the normal reciprocal innervation of muscles is still found, while in chorea and athetosis it is wanting. His conclusions are so interesting that they may be here repeated. "Tremor is an involuntary movement belonging to the old motor system (infra-cortical subpallial), while choreo-athetosis is an involuntary movement of the new (cortical pallial) system." Prof. CRUCHET's close clinical studies of the features of the post-encephalitic Parkinsonian state and of paralysis agitans have led him to the conclusion that the two conditions are entirely different, a view which we think few neurologists in this country will support. His description of what he calls the bradykinetic syndrome approximates very closely to the akinesia of Dr. WILSON. But where he differs profoundly from most authorities is in his denial of the existence of any true rigidity or muscular hypertonus in the Parkinsonian state, an opinion in which we confess ourselves unable to follow him, though with many of his differential points in diagnosis between paralysis agitans and the post-encephalitic Parkinsonian state we are in full agreement. We feel

that these Croonian lectures should be of service in disentangling essentials from a mass of confusing hypotheses, which have been erected on an unstable base of unconvincing attempts in the correlation of clinical symptoms with the facts of morbid anatomy. In the unravelling of the problems of disease of the human nervous system the clinical method must always hold the first place and the value of these lectures as an example of close and unbiased clinical studies is great. They should serve to quicken interest in a difficult subject and rouse the possibly flagging spirits of any who may have been led to think that the day was past when purely clinical methods could achieve progress.

FOOD SOPHISTICATION IN 1924.¹

THE sophistication of food is a tempting form of deceit, and the last report of the Ministry of Health shows that it has not lost its attraction for various trades. When the purveyor causes 2 lb. of sugar to appear where only 1 lb. grew before he is expressing his impulse to cultivate; in selling them by misrepresentation he is educating his wits; financially he is satisfying his acquisitive instincts. But these considerations do not appeal to a public which expects a pure food-supply. Wherever and whenever found such offenders should be treated in accord with their demerits, and it is matter for satisfaction that in this country to-day their careers are becoming precarious. Under the administration of the Sale of Food and Drugs Act there has been an increased activity on the part of many local authorities during 1924. The total number of samples analysed was 118,000—an increase of 3154 over the previous year—and, either as a result of rising interest in the subject or because of an improving moral atmosphere, the percentage of adulterations showed a slight reduction. A total of 6987 samples, or 5.9 per cent., was reported as adulterated or not up to standard, and, although this figure is very large, it compares favourably with the records of 1923 (6.1 per cent.) and 1922 (6.2 per cent.).

Milk was as usual the chief object of analysis, and of 62,133 samples which were purchased and submitted for analysis 7.7 per cent. were regarded as adulterated or not up to standard. This did not represent any improvement on the figure for 1922 and virtually none on that for 1923; but there were only 160 samples described as contaminated with dirt, as against 197 in 1923, which suggests that the efforts of the Ministry of Agriculture and other cognate bodies towards securing a clean milk-supply are proving effective. In 25 cases successful legal proceedings were instituted against vendors of dirty milk, and the cynical may note with relish that on Sundays there is more tampering with milk owing to the greater demand and a feeling of greater immunity from interference. Samples procured on Sundays in the county of Durham showed adulteration in 27.6 per cent. of cases, although the figure for all the specimens collected throughout the year was only 15.5 per cent. The addition of colouring matter is infrequent. Altogether 68 samples were reported against on account of such additions, and in 33 cases fines or costs were recovered; but in spite of the considerable number of prosecutions against milk-sellers, only two were prohibited from further carrying on their trade. As the fines inflicted were usually not large, it would seem that in all punitive proceedings

reliance has been chiefly placed on the publicity which is given to the guilt. Over 10,500 samples of butter were analysed during the year, but of these only 1.4 per cent. were condemned as not up to the requirements of the Act. Loading with water is the most common treatment, and 74 samples contained water in excess of the maximum of 16 per cent. legally permitted. Foreign fats, such as margarine, were found in 68 samples, and in nine there was more than 0.5 per cent. of boric acid. At Leeds an informal sample of butter was purchased by the police from a hawker in the street. It was submitted to the public analyst, who reported that it was wholly margarine, and the vendor was sent to prison for three months for obtaining money under false pretences. Special interest has been taken in condensed and dried milks on account of the recent regulations dealing with them. A larger number of samples than usual was taken; but it was found that the percentage reported against remained about the same. Some were deficient in fat; three were contaminated with lead, and a good many were sold in tins bearing labels not in accordance with the law; but as the majority of the cases were first offences the local authorities generally contented themselves with cautioning the vendors. The sale of boricised cream without proper notice to the purchasers is still remarkably common. Altogether 196 out of 1089 samples bought as fresh cream contained boric acid, and 24 out of 1016 samples bought as preserved cream contained boric acid in excess of the maximum of 0.4 per cent. allowed. It may be observed in this connexion that the Committee appointed in 1923 by the Minister of Health to consider the uses of preservatives has advised the total prohibition of boron derivatives in food. Their cumulative action is obscure, but appears to be harmful, and from the practical aspect the Committee was convinced that they could be dispensed with in food without serious inconvenience to traders or consumers.

From the reports it would appear that the more unregenerate days of the "wicked grocer" are passing. A sugar adulteration of 0.3 per cent. of cases in 1924 is, comparatively speaking, negligible. The grocer is gaining a vindication from Mr. CHESTERTON'S assertion that

"He sells us sands of Araby
As sugar for cash down."

Full-blooded poets are apt to belittle the grocer, and cry up mine host at the inn, so that the grocer may smile at the discovery that the righteous minds of innkeepers have led them in 13.5 per cent. of cases to adulterate their spirits. Two defendants charged with selling diluted spirits based their defence on notices exhibited in their bars advertising that the alcoholic strength of their wares was not guaranteed; but the ruling went against them on the ground that the article supplied was not of the nature, substance, and quality demanded. The display of notices in bars appears to be relatively inefficient. Not all grocers, however, have abandoned subtlety, and there has been some doubt in various places whether dyed and flavoured maize can legitimately be labelled as custard powder. Furthermore, several jam manufacturers have been prosecuted: one of them was fined £20 and ordered to destroy 1400 lb. of his produce, and another, whose strawberry jam contained not less than 75 per cent. of apple jelly but not one whole strawberry, had to pay a similar fine and costs. It is obvious from this information that the present machinery for detecting and displaying fraud is of great importance. Though it

¹ Sixth Annual Report of the Ministry of Health (1924-1925); Annual Report of the Chief Medical Officer of the Ministry (1924). H.M. Stationery Office, 1925. Each volume 3s. 6d.

would be unwise to argue that the reduction of adulterated samples in two years from 6.2 per cent. to 5.9 per cent. indicates that in 40 years dishonesty will have been abolished in this country for ever, it may nevertheless be admitted that the outlook for the future is encouraging. In the meantime the machinery requires local support and extension.

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE.

THE Fifth International Congress of the History of Medicine was held at Geneva from July 20th to the 24th under the presidency of Dr. Charles Greene Cumston, lecturer in the history of medicine at the University of Geneva, with Sir D'Arcy Power as president of honour. The meetings, which were held in the Athénée, were well attended, representatives being present from Belgium, Cuba, Denmark, France, Great Britain, Holland, Italy, Morocco, Poland, Spain, Switzerland, and the United States. Opening addresses were delivered by the President of the Congress, the President of the Medical Society of Geneva, the representative of the Council of State, the rector of the University of Geneva, and the President of the International Society of the History of Medicine, and were followed by a lecture by Prof. Eugène Pittard, illustrated by lantern slides, on operations in the Stone Age. Special mention should be made of Dr. Cumston's address, which contained an account of the distinguished Geneva physicians Daniel Le Clerc, whom Dr. Cumston described as the father of the history of medicine, Jean Antoine Sarasin, the writer on plague, and Théophile Bouet, the morbid anatomist. In the evening the members of the Congress were entertained by the President and Mme. Cumston at the Hôtel des Bergues, where a concert terminated with the delivery of an ode specially prepared for the occasion in honour of the medical profession. On July 21st the principal papers read were one by Sir D'Arcy Power on the *Disputationes chirurgicae selectae*, or early eighteenth century theses, edited by Albrecht von Halle, and one by Dr. J. D. Rolleston on Voltaire and English doctors, particularly Cheselden, Mead, Hans Sloane, Friend, and Towne, the author of a work on diseases in the West Indies and translator of part of La Henriade. Dr. John Comrie lectured on the eighteenth century neurologist, Robert Whytt, who gave the first clear description of tuberculous meningitis; Dr. Guisan, of Lausanne, on Fabricius Hildanus, the celebrated surgeon of Basle; Dr. J. G. de Lint on a letter of Tronchin dealing with the Suttonian method of inoculation; Dr. Ernest Wickersheimer on the presence of syphilis at Geneva at the end of the fifteenth century; and Mr. C. J. S. Thompson on hygiene in early civilisations. In the afternoon a garden party was held in the grounds of Dr. and Mme. Rilliet's house at Vengeron, where, in addition to an admirable view of the lake and of Mont Blanc, the members of the Congress had an opportunity of inspecting the library of Dr. Frédéric Rilliet, the author of the well-known work written in collaboration with Barkez on diseases of children, and of meeting the veteran paediatrist, Prof. D'Espine, whose resemblance to the late Sir Clifford Allbutt struck several of the British members present. On July 22nd papers were read by Dr. R. O. Moon on Paracelsus and medicine, by Dr. E. B. Krumbhaar, of Philadelphia, on the medical literature of the seventeenth century as exemplified in the Elzevir Press, by Dr. H. Renaud, of Rabat, on some recent acquisitions to the history of Arabian medicine in Morocco, by Dr. Tricot Royen on the history of lepers at Antwerp and Louvain, by Dr. Wickersheimer on the surgeon Jean Gispaden, who flourished at Grenoble and Annecy at the end of the fifteenth century, and by Mrs. Lilian Lindsay on the growth of dentistry in England from the earliest times to the beginning

of the nineteenth century. The afternoon meeting was followed by a visit to the Rousseau Museum and the University library, where a number of rare works were on view. In the evening the Congress was received by the administrative Council of the city of Geneva at the Palais Eynard.

On the following day the Congress made a tour on the lake and visited the Castle of Chillon, when the medical profession of Montreux provided lunch, and then to Evian-les-Bains, where a banquet was offered by the administration of the spa. On the 24th Dr. Wierzbicki read a paper by himself and Prof. A. Wrzosek on auscultation in Poland during the first half of the nineteenth century. Dr. J. W. Courtney, of Boston, dealt with Dr. Benjamin Waterhouse, "the Jenner of America." Dr. De Alcarde of Madrid, exhibited the iron crown used in the middle ages as a cure for certain diseases of the head, and Dr. Bugiel described the life of the Polish students at the Paris Faculty of Medicine in the thirteenth, fourteenth, and fifteenth centuries. Mr. C. J. S. Thompson, in the absence of the writer, read Dr. J. B. Hurry's paper on I-Em-Hetep, prime minister to King Zoser, and afterwards the medical god of Egypt. The secretary of the Congress, Dr. de Peyer, contributed a communication on his ancestor Jean Conrad Peyer, the anatomist and physician of Schaffhausen. The Congress terminated in the evening with a banquet at the Hôtel des Bergues.

The next Congress will be held at Leyden in the last week of July, 1927, under the presidency of Dr. J. G. de Lint.

Annotations.

"Ne quid nimis."

COMFORTABLE WARMTH FOR MENTAL WORKERS.

RESEARCHES¹ carried out by Margaret Fishenden, D.Sc., and R. E. Willgress, B.Sc., on the heating of rooms for sedentary workers indicate that the most comfortable conditions for mental work correspond with an air temperature of about 55° F. in conjunction with the requisite intensity of radiation for warmth; that is, a source of radiant heat with a horizontal component of radiation equivalent to 75 British thermal units per square foot per hour, over the position occupied by the worker. In their work these authors used a room of about 4000 cubic feet capacity, and compared three sources of radiant heat: (1) gas fire, (2) electric heater, (3) low-temperature (up to 750° F.) specially designed heater (6 ft. square), consisting of a shallow sheet-iron box with asbestos back and baffled interior almost filling the hearth opening and heated internally by a series of Bunsen flames playing upon an arrangement of refractory material. They preferred this low-temperature heater because it gave a more uniform distribution of radiation with height, the degree of comfort being greater than with either of the other two radiators. They found that with slightly higher air temperatures than 55° F.—e.g., 58° or 59° F.—a feeling of mental lassitude was produced, although radiation was still required to maintain warmth without physical exertion. Below 51° or 52° F. draughts or the effects of low air temperature became very perceptible, and the typical "scorched on one side, chilly on the other" sensations associated with open-fire heating in cold weather could be felt.

It is the relatively equable climate in Great Britain which renders open-fire heating practicable. Where

¹ Department of Scientific and Industrial Research. Fuel Research Board, Technical Paper No. 12. The Heating of Rooms: A Comparison of the Costs of Different Methods on the Basis of Warmth Comfort. By Margaret Fishenden, D.Sc., F.Inst.P., assisted by R. E. Willgress, B.Sc., A.R.C.Sc. H.M. Stationery Office. Pp. 48. 1s.

long cold winters are experienced—e.g., the Continent, America, and Canada—open fires have to be abandoned, as they do not supply sufficient air heating when the outside temperature is below 45° F., so that closed stoves or central heating are more generally used under these conditions. The authors deal also with air-heating systems, the air being heated either by hot-water radiators, or by ordinary luminous-flame bat's-wing gas burners arranged at suitable intervals around the room at a level of about six inches above the floor. Under such air-heated conditions without any source of radiant heat, an air temperature of about 65° F. is required to produce comfort; this means that the surrounding surfaces must also be at 65° F. and the air velocity very low (about $\frac{1}{4}$ ft. per second even near the floor). It is considered that with a surrounding temperature of 65° F. and ordinary clothing, the human body at rest is able to get rid of the heat produced therein by convection, radiation, and minimal evaporation. Comfort is thus maintained, but these conditions are not so favourable for mental work as when the air temperature is 55° F. and the extra heat supplied by a source of radiant energy. Of course, the air changes by draught up the flue are great with radiant heaters in the hearth, so that there is considerable movement of air in the room. Dr. Leonard Hill has long advocated the avoidance of stagnant air in rooms chiefly because of infection and monotony. He has pointed out in many of his researches that for health and mental alertness, ventilation by open fire and open window is the best in small rooms in this country. The present research confirms this view.

Dr. Fishenden and her co-worker studied also the effects of draughts produced by electric fans. With air velocities of 2, 4, 6, and 8 ft. per second respectively, over the position of the observer dry-bulb air temperatures of 69° F., 72° F., 75° F., and 76½° F. were necessary to sustain warmth, in the absence of radiant heat. They found, however, that with draughts exceeding about 4 ft. per second the movement of air was annoying and detracted the attention from mental work. Of much practical value are the findings of these authors with regard to cost of heating. They calculate from their experiments the cost of different methods for imaginary rooms of 1000, 2000, and 4000 cubic feet respectively, and with occupants up to six in number. For continuous heating in small rooms, hot-water radiators fed from a coke-fired boiler are the most economical; but as the size of the room increases open coke or coal fires become cheaper, especially when there are only a few people in the room. This is because when air heating is employed the whole room must be warmed, however few the occupants, whilst with heating by radiation people can gather around a small fire whatever the size of the room. For intermittent heating, say, when a room is used only for four hours a day, hot-water radiators remain the cheapest for small rooms with more than one or two occupants, but for larger rooms, especially when sparsely occupied, open coal or coke or gas fires become cheapest. For longer periods of use the advantage of open fires over air heating is less pronounced; for shorter periods it is more pronounced. In larger rooms where people cannot gather round the fire, hot-water radiators are usually the cheapest method of heating.

From the health point of view, air heating with stagnation of air in the room is not desirable; and in practice it is often found that conditions of ventilation which appear to favour economy are by no means the healthiest. Thus the poor huddle together with much overcrowding, especially in winter. In China the natives cook their food by means of a fire under a brick platform and use the platform thus warmed as a sleeping couch at night. For many the cost of heating will remain a matter of greater consideration than the acme of hygiene. With the ever-increasing cost of fuel in this country these investigations of the Fuel Research Board have an immediate practical application.

THE DICK TEST.

THE admirable work of Dr. George F. Dick and Dr. Gladys H. Dick on scarlet fever has been followed in this country with keen interest. In January, 1924, they described their skin test for susceptibility to that disease, and in the following month a method of active immunisation. These successes were the result of a number of years of painstaking work and the experimental production of scarlet fever in the human being. In a recent paper¹ they resume this work, and cite further evidence of the production of immunity to scarlet fever. Accurate standardisation of the scarlet fever toxin is essential, and the Dicks state that on testing samples of skin-test solutions from various sources they have found them ranging from one-fourth to four times their proper strength. They believe that a positive reaction may be produced in immune persons by injecting a larger test dose, and that negative reactions may be obtained in susceptible persons by reducing the dose; further, that some skins react with papule formation to intradermal injection of mere sterile salt solution. In order to avoid confusion from this, and from the small reddened area which may be caused by the added preservative, the skin-test dose was so graded that an area of reddening of less than 1 cm. in all diameters is regarded as a negative reaction. On the other hand, an area of reddening, however faint in colour, measuring 1 cm. or more in any diameter, is considered a positive reaction. If the reaction has entirely faded at the end of 24 hours they regard it as negative.

In this country a number of observers have been engaged in testing the Dick susceptibility reaction with results in the main conforming to those obtained in America. Little, however, has been done in attempting to produce active immunity to the disease. The technique for the Dick test is the same as for the Schick test, but it is worthy of note that when the fluid is injected a little more deeply into the skin than it should be, the Dick test is liable to fail where the Schick reaction would appear. Several dilutions of the toxin have been used for experimental purposes, the amount of fluid injected into the skin being kept constant at 0.2 c.cm. The reaction has been found to vary in intensity, in the size of the erythematous area, in its time of appearance, and in the time it lasts. With a dilution of the toxin of 1 in 1000 the Dick reaction appears as an erythematous area (seldom indurated) arising at the site of injection, the erythema varying in intensity in a way comparable to the various tints seen in the different rashes of scarlet fever. The size of the erythematous area varies considerably, but usually measures from about three-quarters of an inch to rather over an inch in diameter. In the experience of Dr. F. Thomson at the North-Eastern Hospital the interval from the time of injection to the commencement of the erythema has averaged from five to six hours, but it may be postponed for 24 hours, and has been observed within two hours. The average duration of the erythema has been about 40 hours, and in two instances only was it under 24 hours. One of these had disappeared in 13 hours when rubbing re-elicited the erythema, which then lasted a further two days. With higher dilutions of the toxin—e.g., 1 in 6000, when injected alongside the 1 in 1000 dilution on the same person—the resulting reactions have been found not infrequently to be as large as with the dilution of 1 in 1000, but their duration was less—seldom lasting 24 hours.

Evidently more work remains to be done before the value of the Dick test can be assessed, but a certain amount of optimism seems to be justified. The occasional failure of the test, when failure is not to be expected, serves at times to create disappointment, but the difficulty in standardising the toxin and the possibility of faulty technique in carrying out the test must be remembered. In the

¹ Journal of the American Medical Association, May 16th, 1925.

meantime it might be well to avoid defining too closely what or what is not a positive result, and to keep exact records of the reactions. The question to which we should like an answer is: Does a positive Dick reaction show that an individual is susceptible to scarlet fever and does a negative result show that he is not? And the answer is not yet forthcoming.

SUBSTITUTED UREAS IN TRYPANOSOMIASIS.

THE undoubted value of the substance known as "Bayer 205," and the obscurity which has hitherto shrouded its constitution, have resulted in focusing attention on its chemical constitution. Since 1923 work of investigation has been carried out in the laboratories of the British Dyestuffs Corporation on the synthesis of certain ureas and their effect upon trypanosomes. The idea of working upon these ureas was suggested by the numerous German patents which had been taken out relating to such bodies, and by a formula, suggested by King in 1921, in which he indicated that the urea was built up by joining two chains which each contained two *p*-amido benzoyl residues. In a paper¹ published in the *Journal of Pathology and Bacteriology* T. H. Fairbrother and others have described in detail the preparation of three ureas and the investigation of their effect on trypanosomes. The trypanocidal action of these substances has been examined by ascertaining the action upon mice infected with *Trypanosoma equiperdum*. This organism is similar to the one which Wenyon employed in estimating the effect of "Bayer 205" in 1921. As a result of their work these investigators were able to show that there is definite evidence of trypanocidal properties in the substituted ureas, which are entirely dependent on the configuration of the molecule and on the groups which go to form it; but the only one of the three synthesised ureas which showed marked trypanocidal properties was the one built up on the formula of Fournau. This substance is the urea from meta-aminobenzoyl para-methyl meta-aminobenzoyl amino-naphthalene tri-sulphonate 4:6:8. Whilst the trypanocidal action of this urea in vivo requires further investigation, it has been found that on injection into a mouse its tolerated dose is 10 mg. per 20 g. mouse. The curative dose is as low as 0.05 mg., and this makes the ratio of curative to tolerated dose of 200:1.

EXPERIMENTAL PNEUMONIA.

PNEUMOCOCCUS pneumonia remains one of the serious infective diseases, and it is singular as being the only bacterial infection in which a knowledge of the causative agent has not resulted in any perceptible reduction in mortality. The isolation of the several types of organisms has done something; the discovery that the form of coccus which so many normal people harbour in their throats is not usually the form which causes fatal pneumonia has partly, but by no means wholly, explained one of the mysteries of the disease; serum therapy has saved some lives, but it has not come into that wide use which guarantees the substantial utility of a remedy. Progress has been disappointing and the state of affairs at present is highly unsatisfactory. Any further knowledge of the relationship of the organism to the lung is therefore welcome, and those who are interested in the subject will find in the current number of the *Journal of Pathology and Bacteriology* (1925, xxviii., 427) an illuminating paper by Dr. J. F. Gaskell, of Cambridge, on the results of infecting rabbits by insufflation. He worked with a single strain of pneumococcus, the virulence of which varied spontaneously or was deliberately altered during the course of his observations, and his main

point is that the effect varies with the virulence and not with the dose. With cultures of low virulence broncho-pneumonic lesions are produced, generally near the root of the lung and strictly localised to the areas originally infected; the animal recovers. With higher virulence localisation is less effective, and by coalescence a lobular pneumonia arises which may extend to pleurisy; with a further increase the whole lobe is involved, giving a true lobar consolidation, often with pleurisy and pericarditis. Finally, with very virulent organisms, an intense fatal septicæmia is obtained with a characteristic miliary lesion throughout both lungs—the lesion, that is, which is produced by subcutaneous inoculation. It will be seen that these results are in accord with the views previously published by Dr. Gaskell and Dr. R. R. Armstrong that the differences between broncho-pneumonia and lobar pneumonia in man are essentially relative rather than absolute, and depend mostly on the ability of the lung to localise the original infection by an inflammatory reaction. We seem to have here evidence that the progressive spread of severe acute lobar pneumonia, which is so striking a feature of the disease anatomically and clinically, is due to the qualities of the pneumococcus rather than those of the lung involved. The suggestion that dose is relatively unimportant corresponds well with the experience that overcrowding, which is the great practical factor which determines dose in respiratory infections, has little to do with the occurrence of the disease.

RESEARCH ON DISTEMPER.

SOME years ago the resemblance between distemper and influenza associated in a common effort those who love their fellow men and those who see in them only one more reason for admiring dogs. Since 1923 the Medical Research Council has coöperated in the work on distemper undertaken by the *Field*, and at specially constructed premises near Mill Hill much has been done under a technical committee nominated by the Council. The special study of filterable viruses associated with distemper was entrusted to Dr. P. P. Laidlaw, with the coöperation, in particular directions, of Mr. C. C. Dobell, Dr. W. E. Gye, and Mr. J. E. Barnard, and it is greatly to be hoped that the conclusions reached, or at least the methods devised, by the two last in their work on cancer may prove of value in elucidating distemper. In the meantime, however, much necessary preparatory work has been done, and useful knowledge has been acquired about the propagation and spread of the disease. Its contagion is remarkably easily conveyed—e.g., by the hands, boots, or clothing of persons who have been in contact with dogs suffering from the disease—and it was necessary to erect elaborately insulated buildings in which to carry out the experiments. A fence which cannot be climbed surrounds them, and in the wall of the compound is a cleansing room which is the only means of going in or out, and in which all who enter must abandon their garments, take a bath, and put on sterilised clothes. The exact risk of the carriage of infection by flies is still unknown; but, although it has not been possible to protect all the kennels from them, their exclusion from the hospital is strictly enforced. It has been difficult to provide a supply of dogs perfectly free from infection and free from any acquired immunity. To produce these "clean" and susceptible subjects several generations have been bred under controlled conditions, and the investigators are now suitably supplied. Canine distemper, however, occurs in ferrets, and the use of these animals, which should be popular with rabbits, has led to economy in effort and expense. Moreover, it is hoped that a mild form of virus may be obtained from ferrets which will be useful in producing immunity in dogs. The *Field* should have high appreciation in the medical profession for its contribution to this sound and important work. Apart from the ever-present chance of research on one subject throwing light on another, the fact that man has modified canine evolution and

¹ Jour. of Path. and Bact., vol. xxviii., 1925, by Thos. H. Fairbrother, M.Sc., F.I.C., F. A. Mason, M.A., Ph.D., F.I.C., W. H. Perkin, F.R.S., and Arnold Renshaw, M.D., D.P.H.

fashioned the races of dogs in accordance with his own ideas to be his servants and friends, makes him responsible for compensating them out of the fruits of his increasing knowledge.

MEMORIAL TO THE LATE DR. HERBERT WILLIAMSON.

ALTHOUGH he died in the plenitude of his powers, Dr. Herbert Williamson had been for nearly 20 years a member of the staff of St. Bartholomew's Hospital, where it was early recognised that he had beyond other men the gift of imparting knowledge. The proposal is therefore peculiarly fitting to establish a memorial to him in the hospital itself, and it is made with the full approval of the medical council of the hospital. The form which the memorial takes must depend upon the sum subscribed, but it is hoped that at least a sufficient amount may be secured to endow a bed in the department in which he worked. Subscriptions from Dr. Williamson's former colleagues, students, and friends may be sent to Mr. J. Barris, F.R.C.S., 50, Welbeck-street, London, W. 1.

THE PRICE OF GOVERNMENT ISSUES.

On the occasion, some three years ago, of the publication of the Annual Reports of the Registrar-General for England and Wales and for Scotland, we remarked on the high and increased price demanded for these valuable issues. We were moved to comment by the fact that the preliminary figures issued by the Registrar-General at that date happened to be of vital interest to all public health authorities, so that a restricted circulation, due to high cost of purchase, could only be regarded as of real public disadvantage. Especially did it seem that the prices demanded would constitute a distinct penalty upon public health officers, while it was urgently important that these officers should have them under their hands for reference—indeed, all medical men requiring to verify the statistical bases of their work should have access to them. We learn therefore with pleasure of certain circulars from the Ministry of Health, admitting that the price of the Registrar-General's statistical reviews has been a subject of real concern to the Ministry, and proposing to mitigate the situation in important directions. The effect of the circulars is to offer the "Tables Part I—Medical" and "Text" volumes of the Statistical Review to public authorities and medical officers at a reduced price of 12s. 6d. per annum (instead of £1) on condition (1) that a subscription is taken up for five years and (2) that a sufficient response is received to justify an enlarged edition. The authorities are also informed that it is within their power to incur expense in providing the volumes for the use of their medical officer.

Even when protesting against the price demanded for these publications we were aware of the difficulty in which the Ministry were placed and would be placed, by the attempt to lower the figure, and we are not surprised to learn that even at the present prices the publication entails a heavy loss on the Exchequer. We have here the position with which publishers of scientific works are always faced, for in the nature of things they are dealing with two irreconcilables—the cost of production must be very high because of the special character of the work, and for the same reason the circulation cannot be widespread. But drastic curtailment in the scope of such work is the last thing that the medical profession or the public services would desire. Economy at such a cost would be disastrous. The only practical policy is to increase in every way the circulation, for no one would consider as a practical proposition the whittling down of the information contained in the reports until their practical utility was gone. The absence of a sufficient number of purchasers is the key to the situation, but it can hardly be expected that public health officers will find at their private expense the money to buy documents required in discharge of their public duties,

especially when the sum required is considerable. The indication from the Ministry of Health to the local authorities that they have legal power to purchase the Statistical Reviews for the use of their medical officers removes at once an obstacle to a more general employment of these volumes, and in this way helps to solve the problem. The special price will not be confirmed until it is seen whether sufficient support is forthcoming, and the responsibility is now with the public health authorities and services for accepting the welcome opportunity offered. As is suggested above, the volumes are of obvious use to others besides those for whom the new arrangement has been designed especially; not only official departments and medical practitioners, but the public, through public libraries, may be moved to be purchasers, and by swelling the bulk of the circulation bring down the price of the volumes to a lower level.

POST-GRADUATE EDUCATION IN LONDON.

THE Minister of Health has appointed a Committee "to draw up a practicable scheme of post-graduate medical education centred in London." The Committee, whose chairman will be the Minister of Health himself, is constituted as follows: Lord Dawson of Penn, Sir Humphry Rolleston, Sir John Bland-Sutton, Sir Thomas Horder, Sir George Newman, Sir George Blacker, Prof. Hugh MacLean, Dr. R. A. Bolam, Dr. H. G. Dain, Mr. H. J. Paterson, Dr. J. Parkinson, Dr. H. L. Eason, and Mr. A. E. Webb-Johnson. The appointment of this Committee follows closely on the visit to this country of the Inter-State Post-Graduate Assembly of America, when Dr. Charles Mayo repeatedly advocated the foundation in London of a graduate school which should draw students from all quarters of the English-speaking world.

MEDICINE AND THE LAW.

Case of Alleged Malpraxis: Withdrawal of a Claim.

AN interesting case was recently heard before Mr. Justice Fraser, when damages were sought from Dr. R. G. Clements by an employee in the tramways department of the Manchester corporation for alleged malpraxis. The plaintiff had been attended for rheumatism, and his statement was to the effect that he had suffered no pain in his eyes until the doctor's assistant "flicked some powder from a box into them." Medical evidence for the defence showed that the plaintiff's condition could not have been caused by the drug, but that rheumatism, for which the plaintiff was first treated, and his eye-trouble were due to the common cause of an autogenetic poisoning. The defendant gave evidence, supported by specialists, to the effect that the general condition of the plaintiff and the condition of the eyes were due to a focus of poisoning which affected different parts of the body at different times, and before the medical evidence for the defence was completed the plaintiff's counsel intimated that he did not consider it right to go so far as to leave the case to be decided by the opinion of a jury. He withdrew on plaintiff's behalf every aspersion of any kind against the defendant, the proceedings having been brought under a misconception of the facts. The judge, in directing the jury to return a verdict for the defendant with costs, stated that there was not the slightest foundation for any suggestion of negligence, that it had been made abundantly clear that there were no grounds for any of the imputations, and that the course taken by counsel for the plaintiff was one that would have been expected from one of such legal experience.

The case is of importance to the medical profession as it illustrates the tendency on the part of patients to jump to conclusions on medical subjects without having the necessary knowledge to support the conclusions. The conduct of the defence was entrusted to the Medical Defence Union.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXIV.

THE TREATMENT OF PSEUDOCOXALGIA.

THE rationale of the treatment of pseudocoxalgia cannot be readily understood without a clear understanding of (1) the nature of the disease, (2) the various suggested causes, and (3) the clinical signs which vary in each phase of the process. As will be seen, treatment is different in the different phases.

-Nature of the Disease Process.

Pseudocoxalgia is a condition of the hip-joint commencing in young children between the ages of 5 and 10, until recently not distinguished from tuberculous disease, and identified by means of serial radiograms which show a characteristic cycle of changes in the head and neck of the femur. Clinically, radiographically, and for the purposes of treatment, pseudocoxalgia may be divided into three stages named according to the predominant change in the head of the femur as seen in the X rays. Normally, in the child, the head of the femur consists of a cartilaginous envelope enclosing a bony nucleus. In the X rays the bony nucleus appears as a dense shadow. The surrounding cartilaginous envelope casts no shadow, but its extent can be judged by the clear space shown between the head of the femur and the acetabulum. The changes of pseudocoxalgia concern both the bony nucleus and the cartilaginous envelope.

In *Stage 1*, the stage of flattening, the head of the femur retains its normal shape as a whole, but the bony nucleus becomes smaller; there is more cartilage and less bone in comparison with the normal. Not only is the bony nucleus smaller but its density is irregular; in parts it is more, in others less opaque than usual.

In *Stage 2*, the stage of fragmentation, the cartilaginous envelope becomes flattened; it is no longer hemispherical but is spread out over a wide area and the neck on which it sits expands to accommodate it. The ossific nucleus becomes fragmented and in places disappears completely. It is as though the strength of the head of the femur has departed with the disappearance of the bony nucleus, and as a result the cartilaginous envelope has been flattened out by the superimposed body-weight of the patient.

In *Stage 3*, the stage of repair, the cartilaginous envelope retains the flattened expanded form it acquired in stage 2, while the bony nucleus gradually re-forms until a final stage is reached when the ossific centre has filled out the misshapen cartilaginous envelope, leaving only a narrow peripheral margin of cartilage. The time necessary for the completion of this cycle of changes—flattening, fragmentation, and repair—is uncertain. It is usually considered that two or three years elapse before repair is established.

Ætiology.

A number of different causes have been suggested to explain the changes of pseudocoxalgia; of these only two need here be considered—viz.: (1) That pseudocoxalgia is a mild inflammatory condition affecting the head of the femur. The arguments against this are many: Often the condition is without symptoms at any stage, and in nearly every case is symptomless in stage 1. In contra-distinction to inflammatory conditions, such as tuberculous disease of the hip-joint, the radiographic changes precede the clinical signs. Microscopic examination reveals no evidence of inflammation. Abscess formation is unknown. The blood count never shows a leucocytosis. The Pirquet test is usually negative and the Wassermann

test is invariably negative. (2) That the condition is due to trauma. The traumatic theory best explains the sequence of changes in the head of the femur. This theory supposes that, following a mild trauma, the blood-supply to the epiphysis is damaged, and the bone cells, deprived of their nutrition, die or at least become decalcified. The cartilage which derives its nutrition from the synovial fluid of the joint remains alive, but with the disappearance of the bony nucleus there is nothing to retain the shape of the epiphysis which, therefore, is flattened out under the influence of the body-weight of the patient. Eventually, the vascular supply is restored and new bone is laid down, but not before the epiphysis has become misshapen and deformed. Pending a more exact knowledge of pseudocoxalgia the acceptance of this theory is justified when the results of treatment based on the theory are reviewed.

Clinical Signs: Management.

As noted above, the clinical signs and symptoms, as also the treatment, vary with the stage of the disease.

In *Stage 1* there are few or no clinical signs, and for this reason only a few patients with the early changes of pseudocoxalgia come under observation. There may be a limp, and careful examination will reveal a slight limitation in the range of movement at the joint; the X rays will show the characteristic change in the head of the femur. Various authorities, particularly on the continent, have stated that treatment will not prevent the characteristic cycle of X ray changes. Observation on the effect of treatment in early cases of pseudocoxalgia does not confirm this statement. It is true that even with efficient treatment fragmentation does occur—one cannot diagnose the condition as pseudocoxalgia without; but I am convinced that if the patient is seen early—before the cartilaginous capsule has become flattened and spread out—this flattening can be prevented by the removal of superincumbent body-weight, so much so that when repair has taken place it may be difficult to tell which hip has been affected. It is important to prevent the flattening; the flattening leads to a large expanded head which will not fit into the socket of the acetabulum and the function of the joint is thereby impaired. The relief from weight-bearing should be continued until sufficient bone has been re-formed in the epiphysis to bear the body-weight without danger of the head becoming deformed. If the body-weight is removed the epiphysis does not flatten and the fragmentation of the bony nucleus is not so clearly shown and it is therefore difficult to know when the stage of regeneration has commenced; in view of this uncertainty six months' relief from weight-bearing should be the rule. The surest way of doing this is to confine the patient to bed; but the patient may be allowed up on crutches with a patten on the boot of the sound leg providing the parents can be made to understand that the child must on no account put the foot of the affected leg to the ground. Movement at the hip does no harm. Treatment only aims at preserving the shape of the head of the femur during the stage when it is soft and malleable.

In *Stage 2* the clinical signs are those of irritation of the joint, and may exactly simulate those of an early tuberculous arthritis of the hip-joint—i.e., limp, wasting (usually slight, however), deformity, and limitation of movement in all directions caused by muscular spasm. On the traumatic theory, one may suppose that the signs of irritation are due to the fact that the contour of the flattening expanding head no longer corresponds to the contour of the acetabulum. This stage may be of long or short duration or may even never exist; many cases of pseudocoxalgia do not at any stage reveal their presence clinically. As regards treatment, rest is indicated for as long as the signs of irritation persist. The body is attempting to treat itself on these lines by keeping the joint still by muscular spasm. By rest is meant avoidance of weight-bearing and cessation of movement at the joint. The child should therefore be immobilised on a hip-abduction frame in bed.

Alternately, a plaster-of-Paris spica will enable the child to get about on crutches with a patten on the boot of the good leg to prevent the affected leg touching the ground.

In *Stage 3* the cycle of changes known as pseudocoxalgia are at an end. The active process—whatever it is—has terminated; repair is completed. When, therefore, a patient with pseudocoxalgia is seen in this stage no treatment is called for in respect of the pseudocoxalgia, but the function of a hip-joint that has been altered by the process may be improved. Instead of the normal spherical head of the femur fitting into an exactly similar shaped acetabular socket, the head has an expanded, flattened surface which is markedly different from the contour of the acetabular socket. This incongruity between the shape of the head and the shape of the socket may give rise to two conditions which will impair the function of the joint:—

(1) There may be a limitation of movement preventing normal use of the limb. The important movement that is apt to be restricted is abduction; the leg will not abduct beyond the midpoint (sometimes there is fixed adduction). Now, abduction at the hip is essential for a normal gait. If abduction is impossible, when weight is borne on the affected leg, the pelvis cannot be raised on the opposite side, and to preserve the balance of the body the trunk is thrown over to the affected side, exactly as happens in the gait of a patient with a congenital dislocation of the hip. This "dipping" gait is unsightly and can be overcome by performing a trans-trochanteric osteotomy of the femur and resetting the fractured femur with the lower fragment abducted, as in the treatment of an old tuberculous hip with adduction deformity.

(2) As a result of the asymmetry of the opposed contours of the head of the femur and the acetabulum osteo-arthritis changes occur, causing pain and stiffness and limitation of movement at the joint. The continued irritation, leading to osteo-arthritis changes, can be prevented by an operation at which the head of the femur is exposed and moulded by trimming off its expanded periphery so that it conforms more in size and shape to the acetabular socket. The contour of the head is not changed by this operation, but its size is diminished to such an extent that it will fit into the acetabulum. This does not damage the joint as the remodelled head is covered for the most part with cartilage and fits into an acetabulum lined with normal cartilage.

Summary.

In *Stage 1*, relief from all weight-bearing is required to prevent the softening head from being flattened out by the weight of the body. In *Stage 2*, when signs of irritation are present, rest is indicated—relief from weight-bearing and from movement. In *Stage 3* no treatment is required. In the aftermath of pseudocoxalgia an osteotomy of the femur may be necessary to increase the range of abduction of the limb, or a modified arthroplasty may be desirable to prevent arthritic changes developing in the joint.

GEORGE PERKINS, M.Ch. Oxf., F.R.C.S. Eng.,
Assistant Surgeon, Royal National Orthopædic
Hospital.

SUPERANNUATION FOR MUNICIPAL OFFICERS.—The Minister of Health and the Secretary for Scotland have appointed a committee to inquire and report whether any amendments are required in the Local Government and Other Officers Superannuation Act, 1922, and in particular (a) whether it is desirable that the scheme of superannuation established by that Act should now be made obligatory on all local authorities; and (b) whether that scheme should, with or without modification in respect of particular classes of officers, be made applicable to all persons in the employment of those local authorities, other than school teachers and police. Dr. Drummond Shiels, M.P., is a member of this committee, of which Sir Amherst Selby-Bigge is chairman, and Mr. V. L. Harkness, of the Ministry of Health, secretary.

Special Articles.

THE TUBERCULOSIS CONFERENCE.

LONDON, JULY 6TH-7TH.

THE eleventh annual conference of the National Association for the Prevention of Tuberculosis was held in the Robert Barnes Hall of the Royal Society of Medicine on July 6th and 7th, and reference has already been made to the opening session and to Prof. Pirquet's opening address, read in his absence by Dr. Richard Wagner (Vienna).

Sir William Thompson, Registrar-General to the Irish Free State, submitted a statement showing, for each sex, the tuberculosis mortality under 5 years, 5 and under 10 years, 10 and under 15, and at all ages, in Ireland, per 1000 of the population at these ages, in the years 1911 and 1924.

Year.	Mortality from tuberculosis in Ireland per 1000 population.			
	Under 5 years.	5 and under 10 years.	10 and under 15 years.	All ages.
1911 { Males ..	2.09	0.70	0.80	2.14
Females ..	1.96	0.87	1.48	2.09
Persons ..	2.03	0.79	1.14	2.12
1924 { Males ..	1.00	0.45	0.55	1.41
Females ..	0.85	0.44	0.89	1.48
Persons ..	0.93	0.44	0.72	1.45

Bovine Infection in Children.

Dr. A. Stanley Griffith (Field Laboratories, Cambridge University) detailed the results of the investigations he had made since 1911 on human and bovine infections in children and adults. It had been suggested, he said, on purely theoretical grounds, that small doses of bovine tubercle bacilli in milk might be beneficial to children by conferring on them an immunity to the more dangerous human infection. This hypothesis was based on two assumptions: (1) that the bovine tubercle bacillus was less virulent for man than the human tubercle bacillus; (2) that small doses of bovine tubercle bacilli generally produced mild and curable lesions. But there was evidence that the bovine tubercle bacillus had, if anything, a slightly higher intrinsic virulence for man than the human tubercle bacillus, and that the absorption of a small number of bacilli from the alimentary tract might lead to serious and fatal disease in susceptible infants and children. He had made examinations in the cases of two children, aged 2 and 6 years, who died of tuberculous meningitis; in both instances there were only minimal lesions in the mesenteric glands. Moreover, there was little doubt that the vast majority of the cases of surgical tuberculosis of bovine origin were produced by small doses of tubercle bacilli, since in these cases there was clinically no evidence of disease of the alimentary tract.

It was known that an animal already tuberculous is more resistant to an experimental infection than a normal animal. And it was reasonable to suppose by analogy that a child suffering from a chronic form of tuberculosis, whether of bovine or of human origin, may be more resistant to a subsequent infection. There was, however, not the least evidence that the absorption from the alimentary tract of a small number of bovine tubercle bacilli, which produced no lesions, had a significant or lasting immunising effect.

The numerous instances in children and adults of calcareous and encapsuled lesions which no longer contained living tubercle bacilli could only be taken as evidence of a natural immunity which might or might not have been enhanced by the infection.

Anticipatory De-tuberculisatlon.

In the afternoon the discussion was opened by Prof. Sir Robert Philip, Vice-Chairman of the Association, who outlined the recent progress of the preventive treatment of tuberculosis in children. One suggestion made was that children born of tuberculous parents should be separated at once from any domestic source of infection, as was successfully practised among cattle. But this method only shelved or delayed the risk. Under present conditions of communal life such a child must run the gauntlet of exposure to infection on subsequent occasions. The same fallacy underlay most attempts to obviate exposure to infection. While in earlier years of infancy it was doubtless sound to delay or minimise exposure, we must be careful not to credit the procedure with undue potential.

A similar fallacy attached to procedure based on the "Grancher" principle, in accordance with which delicate children, sometimes wrongly termed "pre-tuberculous," were transferred from dubious home environment to presumably healthy surroundings in the country. It was frequently suggested, and seemed to be generally believed, that the children were thereby saved from infection. In actual fact, most of the children thus taken in hand were already tuberculised. The excellent results frequently attained were to be attributed to heightening of the child's resistance by maintenance of improved environment—in other words, to a progressive de-tuberculisatlon along natural lines.

Another proposal was that prior to "spontaneous" infection the child should undergo artificial inoculation (vaccination) in order to anticipate the effect of exposure to infection. Various attempts in this direction had been made. According to Calmette's recent adaptation of the principle, the infant was given by the mouth on the third, fifth, and seventh days after birth a measured quantity of tubercle bacilli, the virulence of which had been reduced by repeated culture on a special medium. It was claimed that a temporary immunity to "spontaneous" infection was thereby attained; the claim was supported by encouraging observations on calves, but it had yet to be seen to what extent, in the absence of illness, parents would consent to submit their newly-born infant to inoculation with tubercle bacilli, however modified, and however simple the process might be. Time and intensive education would be required to leaven popular opinion to the necessary extent.

The plan introduced by the speaker under the name "anticipatory de-tuberculisatlon" proceeded on the assumption that infection practically always took place during childhood, that the occurrence of the subsequent process of tuberculisatlon might be definitely determined, and that it was possible to limit and counter tuberculisatlon by a process of de-tuberculisatlon.

The process of anticipatory de-tuberculisatlon had two aspects: (1) Environmental. The influence of improved environment on the resistance of the individual was admitted by all and the principle of the sanatorium should be carried into the whole of social life. (2) Antigenic—by the use (percutaneous) of tuberculin. Antigenic treatment should be commenced when the fact of tuberculisatlon was definitely established.

The remarkably uniform results observed over many years had much impressed him; not only was the local and immediate result satisfactory, but a systemic influence was exerted which tended to be permanent.

Percutaneous Application of Tuberculin.

Dr. Fergus Hewat (assistant physician, Edinburgh Royal Infirmary) gave an account of the percutaneous application of tuberculin which he had carried on for five years among out-patients from the wards and later at the special tuberculosis clinic. The patients included children with well-marked tuberculous cervical glands on which the surgeon did not advise operation, a number of post-operative cases,

and also a considerable number of children who showed a positive tuberculin skin test, slightly enlarged cervical glands, and some degree of muscular wasting, and whose parents stated that they were always tired, that they failed to gain weight, and had poor appetites. In some of these children there were ill-defined abdominal symptoms with attacks of colic at intervals, and palpation showed slight resistance of the abdominal wall towards the right lower quadrant of the abdomen.

If the presence of any local source of septic absorption or any disease other than tuberculosis had been negatived, the children were given a test dose of 10 per cent. Moro's tuberculin ointment made up from Koch's original old tuberculin: this was rubbed into the skin, usually below the clavicle, and if a positive skin reaction was obtained treatment was given once a week, the strength of the ointment being gradually increased as the skin reaction became less pronounced.

No symptoms causing anxiety had occurred during the treatment of these children and very rarely indeed in adults; children were somewhat sleepy the day after the application, and showed a varying degree of skin reaction. Severe reactions amounting to eczema were completely healed in two or three weeks by a simple dressing of olive oil. During the treatment the toxic elements of the clinical picture gradually disappeared; in some two or three months the mothers would say that the children were brighter, more willing to play with other children, and had better appetites. Later the record sheets showed a steady gain in weight, the muscular irritability becoming less, and the children appearing less tired; any abdominal symptoms and physical signs disappeared.

Success was achieved in most cases; failures occurred especially among adults, but the regularity of attendance of the patients was a good index of the benefit they received. In children satisfactory results could be obtained from the use of tuberculin, particularly in a type of patient that drifted in an aimless way from one medical agency to another, never really ill and certainly never fully fit.

Ubiquitous Infection.

Dr. Clive Riviere (Victoria Park Chest Hospital) said that it was generally acknowledged that under present conditions in a civilised community infection with the tubercle bacillus could not be avoided, that such infection was dangerous in early infancy, and that in later childhood a very considerable resistance to tuberculosis was encountered. He laid considerable stress on the importance of immunity; it was mainly due to the general tuberculous infection and the immunity it had given that most of us were able to walk about the tubercle-soaked modern world without any obvious risk.

Prof. Louise McIlroy (Royal Free Hospital) pleaded for better institutional accommodation for pregnant tuberculous women and urged the provision of a special sanatorium with an obstetric staff in London or on the outskirts.

In the evening the annual general meeting of the Association was held in the Robert Barnes Hall. An excellent account was given of the work carried on, including propaganda and the conduct of the Burrow Hill Colony, Frimley, and the Association's new films, the "Invisible Enemy" and "Air and Sun," were shown.

Surgical Tuberculosis.

On the second day the conference was presided over by Sir Robert Philip.

The discussion was opened by Sir Henry Gauvain, who expressed his complete agreement with the views of Dr. Stanley Griffith on the importance of dealing with tuberculous milk, and showed slides illustrating the treatment at Alton and Hayling Island. He thought that personal cleanliness in the house was of more importance than roominess in the prevention of human tuberculosis; a clean pigsty was safer than a clean palace. A false delicacy

sometimes prevented instructions being given to the consumptive as to the necessary precautions. The horizon was widened nowadays; tuberculous arthritis was treated as arthritis in a tuberculous subject and attention no longer concentrated on the local lesion.

No special hospital for the treatment of surgical tuberculosis could be considered complete unless it possessed an out-patient department where discharged patients could periodically be examined, advised, and assisted. On discharge, full, complete, and individual directions should be sent to each parent or guardian. Advice in the choice of occupation and assistance in obtaining suitable employment should be forthcoming as well as medical help. Relapses might occur, deformities might arise, or neglect of simple rules of hygiene might create dangers to be combated and avoided. Facilities were desirable for sending old patients who needed change to open-air camps or holiday homes, particularly those working in conjunction with or under the management of the parent institution. Some cachectic patients, though no longer suffering from active tubercle, urgently required a prolonged stay in residential open-air schools. Others, whose deformities remained in spite of all endeavours to remedy them, should be transferred to a residential technical school for training in a trade suited to their limitations. Without such training restoration to health was insufficient to make them self-supporting, self-respecting citizens.

Prof. J. Fraser (Edinburgh) commented on the very large number of country children with surgical tuberculosis sent into the Edinburgh Children's Hospital, and explained it by quoting the experience of a medical friend who when being shown round a farm noticed a "fevered" cow, obviously heavily infected with tuberculosis, the milk of which was kept for the minister and his family, with the result that Prof. Fraser had to be called in to attend the sufferers. Inspection and supervision of milk were often a dead letter in Scotland; the staff of sanitary inspectors whose duty it was to supervise the production of milk was ridiculously inadequate, and insufficient encouragement was afforded to them in carrying out their duties. The phraseology of the legislation on milk gave him the impression that the wording was arranged to safeguard the producer rather than the consumer. He showed lantern slides illustrating the treatment of surgical tuberculosis at the municipal hospital at Colinton. He thought a word of warning was necessary against the use of mercury-vapour lamps by any except trained workers.

Dr. W. T. Gordon Pugh (C.M.O., Surgical Tuberculosis Service, Metropolitan Asylums Board) gave an account of the work at Carshalton where half the beds are reserved for surgical tuberculosis. He attributed the great improvement obtained nowadays in return of function to improvements in the appliances used and to the fact that a larger proportion of children were now transferred to suitable country hospitals at a comparatively early stage. But he feared that even now some patients were retained in London for weeks, months or even years when they should be in the country. In the first three months of a joint affection even a week's delay in securing constitutional treatment might mean in some cases permanent stiffening instead of complete functional recovery.

The speaker concluded by showing lantern slides illustrating the special spinal and hip frames and carriages used at Carshalton, designed to facilitate the application of heliotherapy, arc-lamp treatment, and gymnastic exercises, while immobilising the diseased part and facilitating locomotion.

General Discussion.

Dr. H. B. Bates (chairman, St. Helens Public Health Committee) initiated a resolution of the conference on the paramount importance of a tubercle-free milk-supply. Councillor Mrs. Dollan (Glasgow) spoke of the lack of courage of those who advocated such half-measures as pasteurisation in dealing with the

evil. Prof. Share Jones (Liverpool) wanted full compensation for all tuberculous animals slaughtered for the public benefit. Dr. J. D. C. White (Harrow U.D.C.) elicited from Sir Henry Gauvain an advocacy of the carbon arc lamp for general purposes. Dr. R. M. Fenn (district T.O., West Riding C.C.) mentioned the help the N.S.P.C.C. afforded in obtaining reluctant parents' consent to treatment of their children. Dr. Morgan (T.O., Wallasey) had found that children after their return from institutions lost weight through insufficient hours of sleep, and Dr. A. Brownlee (Glan Ely Tuberculosis Hospital, Welsh National Memorial) called attention to the folly of patients in an advanced stage of phthisis being allowed to return home to infect young children in the family. Dr. W. B. Tomson (Hastings and St. Leonards Tuberculosis Care Committee) mentioned that in Hastings they had utilised the Grancher system; the Brighton Guardianship Society were placing infants in the villages near Hastings.

Sanocrysin Treatment.

The afternoon was given up to the treatment of tuberculosis by sanocrysin. Prof. Holger Mollgaard (Royal Veterinary College, Frederiksberg) said it could not be too strongly emphasised that this treatment was to be considered as a beginning only; clinical experience had already shown that rightly handled it may contribute a great deal to our present possibilities of curing tuberculosis of the lungs. After relating the principal ideas of chemotherapy, founded on the work of Ehrlich and built up on the numerous investigations following in the wake of salvarsan, he went on to develop the essentials of a rational chemotherapy of tuberculosis in which the peculiar features were the resistance of the tubercle bacillus due to its contained fatty substances and the poverty of the tuberculous tissues as regards blood-vessels. Any bactericidal agent to influence tuberculosis must be capable of penetrating the fatty system of the tubercle bacillus and be capable of reaching the tubercle bacillus by diffusing from the blood through the tissue at a rate faster than it is decomposed in or excreted from the human or animal body. Up to the present sanocrysin, the sodium salt of auro-thio-sulphuric acid, was the substance which best fulfilled the required conditions; the therapeutic agent was the negatively-charged ion AuS_2O_3 .

Extensive animal experiments by Dr. Madsen and himself had established: (1) That sanocrysin is able to produce an acute, very severe intoxication in highly tuberculised individuals when injected in doses of 0.5 to 1.5 cg. per kilo. (2) That this intoxication exhibits all the principal features of tuberculin shock and does not occur in healthy animals, even when much larger doses are injected. (3) That the intoxication can be prevented or alternatively cured by means of a specific serum made by immunisation of healthy horses with killed tubercle bacilli. This meant that it was possible to confer upon tuberculous animals or human beings a specific immunity against the lethal effect of sanocrysin, and proved that the substance had a bactericidal influence on the tubercle bacilli in the organism and that the acute intoxication was due to liberated toxins. From the animal experiments they had learnt that the condition of absence of reaction to sanocrysin meant one of three things: (1) Sterilisation until negative results of guinea-pig tests or in Madsen's experiments until negative result of the inoculation on Petroff's medium. (2) Total immunity with loss of the Pirquet reaction, but without sterilisation. (3) Simple failure to react because the residual bacilli are too well protected by fibrous tissue or calcareous matter. In these cases the Pirquet reaction persists. In the human subject they had observed the last two conditions. To prove the existence of the first in a hospital clinic would probably be very difficult.

In the animal experiments the transitory stage between the disappearance of the clinical signs of tuberculosis in the lungs and the definite loss of

reactions to sanocrysin was marked by "late reactions"—i.e., the reactions appeared two or three days after the sanocrysin injection. This fact was in close accordance with the power of sanocrysin to remain for several days in the blood and to diffuse through animal membranes. In the animal experiments the late reaction had been found only in the last stages of the cure, when the greater proportion of the bacilli had been got rid of. Clinical experience had, however, shown that in tuberculous man late reactions very often occurred at the beginning of the treatment. Such reactions had been found three and even five days after the sanocrysin injection, a fact of great importance because it meant that the injection of a fresh dose within this interval might bring upon the patients the risk of a cumulative effect of the liberated toxins.

The combined sanocrysin-serum treatment had brought about the clinical cure of calves and goats which had been severely artificially infected. Spontaneously infected monkeys, even when in a very serious condition, had been clinically cured, with disappearance of all objective signs of tuberculosis of the lungs, marked decrease of abdominal tumours, and large increase in weight. A year after treatment they were still healthy. The intracutaneous reactions in 12 spontaneously infected calves compared before and after treatment showed that five had lost this reaction and in three cases it had been reduced to the limit recognised in Denmark as representing a cure. In three cases the reaction had remained unaltered and in one case it had grown bigger. As the second tuberculin test was made four months after the treatment, it seemed probable that the loss of reaction was due to a real sterilisation.

Prof. Knud Faber's paper was published in full in THE LANCET of July 11th.

Prof. S. Lyle Cummins, C.B. (University College, South Wales and Monmouth), in a preliminary note said his experience was limited to eight cases, six only of which had been specially selected as likely to respond favourably to sanocrysin treatment. Of the unsuitable cases (the acute pyrexial type with pneumonic symptoms) one had already had five doses of sanocrysin, had suffered very severe reactions and was no better, perhaps rather worse, as a result. Of the other case it was still too early to speak as only two doses had been given, the reactions being very severe. All the selected cases had done well, and the improvement noted in them had been so much more rapid and so much more dramatic than could have been expected in cases of this type that he was unable to avoid the conclusion that sanocrysin was the favourable factor in each of them. His experience led him to think that we should safeguard the use of sanocrysin, not so much by reducing the dosage as by selecting patients with tuberculous lesions of relatively small extent. It would require years of observation and a careful following up of all the cases to decide whether the favourable results so far recorded are permanent.

SIR JOHN MACALISTER MEMORIAL FUND.

A FUND has been opened by the Council of the Royal Society of Medicine to commemorate the 38 years of service of Sir John MacAlister as secretary of the Society. The memorial is to take the form of a portrait to be placed in the Society's house. The list of subscribers to date is as follows:—

Dr. Peter Abercrombie, Dr. James Adam, Prof. J. George Adams, Mr. J. E. Adams, Sir Maurice Abbot Anderson, Dr. W. K. Anderson, Dr. H. Russell Andrews, Mr. Herbert Apperly, Sir Robert Armstrong-Jones.

Dr. Andrew Balfour, Mr. W. Girling Ball, Sir Charles Ballance, Dr. Charles Banks, Dr. G. F. Barham, Lady Barrett, Mr. J. Kingston Barton, Mr. Harold S. Barwell, Dr. E. Clifford Beale, Dr. W. Blair Bell, Sir James Berry, Lady Berry, Sir John Bland-Sutton, Mr. G. F. Harrison Bloom, Dr. Robert A. Bolam, Dr. Elizabeth Bolton, Dr. W. Cecil Bosanquet, Mr. H. Edmund G. Boyle, Dr. Charles R. Box, Mr. G. A. Bradnack, Dr. Edwin

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Mr. H. Morriston Davies, Mr. E. D. D. Davis, Lord Dawson of Penn, Surg.-Comdr. G. O. M. Dickenson, Mr. Alban Doran, Dr. Ernest Dore, Dr. J. J. Macwhirter Dunbar, Dr. J. Gray Duncanson, Mr. E. Craig Dunlop, Mr. Frederic Durham.

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Mr. Arthur J. Hall, Dr. F. de Havilland Hall, Sir William Hamer, Mr. Frank Harvey, Mr. J. P. Hedley, Mr. G. F. Hentsch, Lt.-Col. H. Herbert, Mr. William Hern, Mr. Harvey Hilliard, Mr. Montague L. Hine, Dr. C. Thurstan Holland, Mr. Eardley Holland, Dr. Geoffrey Holmes, Sir Thomas Horder, Mr. C. H. Hough, Dr. Cecil Hughes, Dr. William Hunter, Dr. Arthur F. Hurst, Dr. Arthur J. Hutchison, Dr. Robert Hutchison.

Dr. W. J. Smith Jerome, Dr. A. Mason Jones, Sir Robert Jones.

Mr. Frank Kidd, Mr. T. Pomfret Kilner, Dr. T. Percy C. Kirkpatrick, Mr. Albert Kisch.

Dr. G. H. Lancashire, Sir W. Arbuthnot Lane, Mr. William Lang, Mr. J. B. Lawford, Mr. T. B. Layton, Dr. James Leask, Dr. Henry A. Lediard, Mr. T. P. Legg, Mr. Hugh Lett, Mr. H. Levin, Dr. A. Goodman Levy, Mr. A. H. Levy, Sir William T. Lister, Mr. J. P. Lockhart-Mummery, Sir H. Bell Longhurst, Mr. George John Lucas, Sir Henry Lunn.

Dr. Charles J. Macalister, Sir Donald MacAlister, Dr. Anthony McCall, Dr. John McCrea, Dr. J. A. Macdonald, Dr. P. W. Macdonald, Mr. Robert McKay, Dr. Dan McKenzie, Dr. S. Ridley Mackenzie, Dr. Ashley W. Mackintosh, Sir Ewen J. Maclean, Dr. J. M. H. MacLeod, Dr. Arthur J. McNair, Maj.-Gen. Sir W. Grant Macpherson, Dr. John C. McVail, Mr. E. Distin Maddiek, Sir George H. Makins, Mr. John D. Malcolm, Mr. George P. Male, Mr. H. J. Marriage, Dr. Cecily M. E. Maude, Dr. J. Preston Maxwell, Dr. H. Crichton Miller, Sir William Milligan, Dr. P. S. Mimbela, Dr. R. Pryce Mitchell, Dr. T. K. Monte, Dr. Irwin Moore, Mr. William James Moore, Mr. John Morley, Sir Rutherford Morison, Sir Henry Morris, Dr. R. J. Morris, Sir Frederick Mott, Sir Berkeley Moynihan, Dr. George R. Murray, Dr. John Murray, Dr. J. A. Murray, Dr. Nathan Mutch, Dr. Bernard Myers, Dr. Charles S. Myers.

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Mr. Herbert W. Page, Mr. Stephen Paget, Dr. R. H. Paramore, Mr. Charles A. Parker, Sir Thomas Parkinson, Dr. William Pasteur, Mr. J. Lewin Payne, Mr. Herbert S. Pendlebury, Dr. Gerard Petit, Mr. G. R. Phillips, Dr. Robert C. Pierret, Dr. G. Newton Pitt, Sir R. Douglas Powell, Sir D'Arcy Power, Mr. Douglas S. Pracy, Mr. R. W. Prentice, Dr. Owen Pritchard, Mr. L. P. Pugh, Sir James Purves-Stewart.

Miss May Rathbone, Mr. R. Lindsay Rea, Dr. M. B. Reichwald, Dr. George Rice, Mr. Charles F. Rilot, Dr. Clive Riviere, Sir John Robertson, Dr. Alfred R. Roche, Sir Leonard Rogers, Sir Humphry Rolleston, Dr. T. A. Ross, Dr. Amand Routh, Dr. J. S. Risien Russell, Mr. E. Canny Ryall, Dr. John A. Ryle.

Mr. Louis Savatard, Dr. Mary Scharlieb, Mr. C. Schelling, Mr. Sydney Scott, Dr. James Searson, Dr. James H. Sequeira, Sir Seymour J. Sharkey, Dr. H. Batty Shaw, Dr. Edward B. Sherlock, Mr. James Sherren, Dr. W. Knowsley Sibley, Dr. Charles Singer, Dr. Harold Sington, Mr. E. G. Slesinger, Dr. Heywood Smith, Mr. J. Priestley Smith, Dr. R. Percy Smith, Mr. Ivan S. Spain, Dr. Herbert R. Spencer, Mr. Walter G. Spencer, Mr. W. T. Holmes Spicer, Dr. E. I. Spriggs, Dr. Graham Steell, Dr. W. Gream Stone, Dr. Florence A. Stoncy, Dr. Septimus Sunderland, Dr. W. S. Syme.

Dr. James Taylor, Sir StClair Thomson, Sir John Thomson-Walker, Dr. H. Letheby Tidy, Mr. Herbert Tilley, Sir Nestor Tirard, Dr. J. A. Torrens, Dr. A. Logan Turner, Mr. G. Grey Turner, Dr. William Turner, Dr. W. Aldren Turner, Dr. G. de Bee Turtle.

Mr. George E. Waugh, Dr. Lennox Wainwright, Dr. Jane Walker, Mr. F. Ashton Warner, Dr. W. M. Crawford Watson, Dr. Patrick Watson-Williams, Mr. A. E. Webb-Johnson, Mr. E. F. White, Dr. J. Douglas C. White, Mr. R. H. Anglin Whitelocke, Dr. T. Stacey Wilson, Dr. Thomas Wilson, Dr. T. Outerson Wood, Dr. A. Stanley Woodward, Dr. H. W. Wunderly, Dr. F. Wyatt-Smith, Dr. Andrew Wylie, Dr. Andrew Ellis Wynter.

The total received to date is £615. The list is still open and subscriptions should be forwarded to the hon. treasurers, Royal Society of Medicine, 1, Wimpole-street, London, W. 1.

NATIONAL HEALTH INSURANCE AND THE MEDICAL SERVICES IN THE IRISH FREE STATE.

(FROM OUR DUBLIN CORRESPONDENT.)

A VOLUME of appendices to the Interim Report of the Committee of Inquiry on National Health Insurance and the Medical Services was issued last week. It contains the various memoranda submitted to the Committee, together with a summary of the evidence given by the witnesses. Nowhere in the evidence is there any opposition to the establishment of a national medical service for the Free State.

The strongest case in its favour was made by Dr. J. Power of the Irish Medical Committee, who received strong support from unexpected quarters. Mr. R. J. P. Mortished, speaking on behalf of the Irish Labour Party, found that a State Medical Service would be very desirable. The General Council of County Councils took the same view definitely in the following opinion:—

"We recommend the establishment of a State Medical Service paid by the State and appointed under arrangements made by the State Health Authority. If it should be found impracticable to establish this service immediately, the promised legislation should make provision for its establishment as soon as possible, and the health scheme should be drafted with a view to its eventual establishment."

As some misunderstanding appears to have arisen as to the precise meaning of this recommendation, the General Council of County Councils was asked to submit a supplementary statement. The secretary of the Council then wrote as follows in regard to his evidence:—

"During the course of my evidence the chairman suggested that the General Council should consider the relative merits of the making of appointments under a State Medical Service, (a) by the central health authority, or (b) by the local health authority from a panel submitted by the central authority. I have consulted the Executive Committee of the General Council on the subject, and am directed to state that, in their opinion, appointments to a State Medical Service should be made by the central health authority on the results of competitive tests—practical, as far as possible. They are of opinion, further, that in the conditions of appointment to a State Medical Service provision should be made for periodical tests of continued professional fitness."

The importance of the advocacy of a State Medical Service by the representative body of the county councils lies in the proof of willingness of these bodies to rid themselves of a patronage they possess at present. Equally important with the support of the county councils is that given by the Department of Local Government and Public Health. A memorandum submitted by the Department in reference to recent administrative changes in regard to medical treatment of the poor says that the Minister, in the changes he has so far made, has kept in view the possibility of a State Medical Service being introduced at a later date, and has been careful to say nothing that might militate against its being set up.

RADIUM AT THE NEW TORBAY HOSPITAL.—Miss V. E. Wills has given £6300 towards this hospital. Of the total such sum between £2000 and £4000 as may be necessary is to be used for the purchase of radium, and a further £500 is allocated for the construction and equipment of a radium room.

PROCESSIONS AND BALLOTS FOR HOSPITALS.—The authorities of the Church of Holy Trinity, Sloane-square, London, have protested to the Council of the Metropolitan Hospital Sunday Fund against the practice of holding Sunday processions of "men, women, and children dressed in weird and often vulgar costumes, the processions being the pretext for a lot of shouting and shaking of money-boxes," and of "appealing to the gambling spirit in issuing hand-bills on 'how to win a fortune for half-a-crown.'" It was pointed out that these processions are organised by an independent committee which gives the proceeds to the hospitals of its choice, but not necessarily to one hospital. The subject of "ballot appeals" was referred to the General Purposes Committee with instructions to report to the Council.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the statistics for 1924 of a group of two county boroughs, one city, and four boroughs:—

Name of borough.	Estimated mid-year population (R.G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Croydon C.B. . .	196,000	17.6	11.6	0.96	1.5	2.3	29	56	2.9
Eastbourne C.B. .	54,830	12.1	10.9	0.79	1.5	1.6	40	58	—
Swindon B. . .	56,570	17.1	10.8	0.94	1.4	2.4	32	63	1.0
Worcester C. . .	50,220	17.2	13.3	0.97	1.2	2.9	22	51	1.1
Colchester B. . .	43,940	16.9	11.3	0.86	1.4	2.0	—	45	0.0
Hyde B.	33,770	14.7	14.0	1.10	1.6	2.7	46	103	4.0
Yeovil B.	16,060	17.6	10.8	0.87	1.3	1.6	42	78	3.5

C.B. = County Borough. C. = City. B. = Borough.
— = information not available from report.

Croydon.

Dr. H. P. Newsholme's report on the public health and school medical service marks an advance all along the line. Unification of the medical and nursing services has been achieved. Each health visitor is now responsible for all forms of health-visiting and school-nursing in her district. The school medical officers are also medical officers to the infant welfare centres, and each one is made responsible for the supervision of the health of the children attending a particular group of schools.

Negotiations have been completed for the extension of Cheam Sanatorium from 50 to 85 beds. There will then be 40 beds for tuberculous patients from Croydon, 40 for Surrey, and 5 for Kent. Early in 1925 the council approved a scheme for the development of occupational work at Cheam. The maternity hospital, St. Mary's Hostel (17 beds), is conducted by the Croydon Mothers' and Infants' Welfare Association, which is subsidised by the council. An additional subsidy for the purpose of extending the hospital and providing 13 additional beds is to be paid, and the council have approved proposals for the erection on a site adjoining the hostel of a new building at a cost of £6330. The new building will provide accommodation on the ground floor for an infant welfare centre and antenatal school, massage, dental and eye clinics, while the first floor will provide a sick nursery of 12 beds, one isolation cubicle, a ward of two beds for nursing mothers, and quarters for the resident staff.

Tuberculosis care work is to be handed over to the Croydon Council of Social Service, a voluntary organisation which coördinates many social activities, and includes representatives of official bodies. The council will provide an organiser trained in social work to assist the tuberculosis officer and the Council of Social Service. An occupation centre for the mentally defective has been established and is giving good results. Another new departure is an arrangement with the governors of the Croydon General Hospital for a public laboratory on an extended scale. Formerly the corporation bacteriological work was carried out at the hospital for infectious diseases. Under the new arrangement the Croydon General Hospital will provide a suitable building for the laboratory. The pathologist will be a salaried officer of the corporation and an honorary officer of

the hospital, and will carry out all the pathological and bacteriological work required by the corporation and the hospital. The new arrangement is welcomed by the medical practitioners of the town. Early in 1925 arrangements were approved for the home nursing of measles, whooping cough, ophthalmia neonatorum, puerperal fever, epidemic diarrhoea, and infantile paralysis by the Croydon Nursing Service at a fixed charge to the corporation of 1s. 4d. per visit for such cases as are referred by the medical officer of health.

The school report concludes with an interesting inquiry into the incidence of adenoids, which is worthy of separate consideration. Adenoids are undoubtedly an important factor in diminishing a child's educational capacity.

Eastbourne.

Dr. W. G. Willoughby reports that the rainfall was 32.73 inches, being about 2 inches above the average for the last 40 years. The sunshine record was 1778.1 hours, which is claimed to be the fourth highest in the United Kingdom, and is 22.5 hours less than the average of the last 37 years. A "peculiar recrudescence" of enteric fever occurred during the year. There were ten cases from January to October, and in all those tested the blood-cultures showed paratyphoid B. No cause could be found, and all the patients recovered. The new male cases at the venereal diseases centre increased from 50 to 58, and the new female cases from 34 to 47. The increase is thought to be due to greater appreciation of the clinic. The existing cases of tuberculosis are being steadily reduced, especially of bone and joint tuberculosis; the deaths from tuberculosis in 1924 numbered 44, compared with an average of 54.7 for the previous ten years. The want of suitable occupation for cases leaving the sanatoria is badly felt, and Eastbourne is no exception as regards imperfection of after-care schemes.

A striking feature of the infant mortality was the large number of deaths during the first weeks of life; thus of 39 infant deaths 27 occurred in the first month. One hundred and forty-three confinements took place at the municipal maternity home. Two of the babies were stillborn, and 13 died within ten days of birth. The infant mortality-rate for the first fortnight after birth in the home was 55 per 1000 births. One hundred and forty-four babies were born in the Infants' Home at 9, Upperton-road. Of these six were stillborn, six died on the first day, and two on the eleventh day. Antenatal work is growing, and 263 expectant mothers sought advice at the two antenatal clinics, a high proportion, seeing that the total births numbered 666. Insufficient housing and unemployment, says Dr. Willoughby, are the most serious adverse factors with which the department has to contend. Allowing six persons per house, about 150 houses are required annually to meet the increase of population. During the six years since the war only 465 houses have been completed. A better supply of small houses is needed. "The outlook for 1925 and 1926 is better and houses costing below £600 may be erected."

Swindon.

Dr. Dunstan Brewer again voices the urgent need for an adequate hospital unit in Swindon. During the past year progress has been made in the sanitary conditions of the district. The sewage works at Rodbourne have been completely reconstructed. The storm-water scheme for the newer part of the town was successfully completed during 1924, and despite the wetness of the year no flooding occurred in the lower part of the town. During 1925 it is hoped to reorganise the collection of house refuse by the provision of sanitary dustbins, and to make progress with the reconstruction of public lavatories. The canal is now practically filled up, thus removing an old-standing nuisance. The housing shortage does not diminish, though 299 new houses were erected in the borough during the year. "The position of the larger families becomes relatively and

actually worse with each succeeding year." The corporation housing scheme is entirely without the borough. Dr. Brewer believes that it is possible to control scarlet fever, and founds his belief on the theory that scarlet fever is only infectious for the first day or two, but that certain persons possess the capacity of remaining infective for unlimited periods. It is by the control of these few infectors that he hopes for results. Diphtheria ceased to be endemic in Swindon in 1921. During 1924 60 cases of this disease were notified, but for the first year in its history no deaths from this disease occurred in the borough. For the better control of acute infectious diseases of the nervous system Dr. Brewer would like to have all forms of meningitis notified. The report contains an interesting appendix on the maternity and child welfare scheme of the borough with suggestions for its future development. The chief expenditure suggested is on a new maternity and infant hospital built on the pavilion system on an adequate acreage, and making provision for diseases of pregnancy, normal delivery, abnormal delivery, the puerperal state, and non-infectious diseases of infants.

Worcester.

Dr. Mabyn Read records that at the beginning of June, owing to the rapid rise of the Severn, 359 low-lying houses were flooded, and that active steps were taken by the health committee to relieve the consequent distress and to cleanse and disinfect the houses after the flood had subsided. The General Infirmary established during 1923 a fully equipped orthopaedic department under the charge of Mr. Norman Duggan, F.R.C.S. In May, 1924, the council appointed Mr. Duggan honorary orthopaedic surgeon to their Newtown hospital for the treatment of bone and joint tuberculosis. A satisfactory scheme has thus been provided for the treatment of these patients. In the first place they attend the orthopaedic clinic at the General Infirmary, where they receive in-patient treatment, if necessary, and are provided with proper appliances. They then continue their treatment in the open-air wards of the corporation Newtown hospital. It is hoped soon to provide artificial-light treatment as part of the scheme.

Colchester.

Dr. W. F. Corfield reports an increase in respiratory diseases probably due to the wet and cold year, but that the pulmonary tuberculosis death-rate is lower than it has been for many years. Five members of the staff at the isolation hospital contracted scarlet fever. All of them made a good recovery. On the other hand, no cases of diphtheria occurred among the staff, and this result may have been due to the fact that all the junior staff who gave a positive Schick reaction were immunised. There was a decided increase in scarlet fever in the borough; 183 notifications, with five deaths. Two of the fatal cases were imbeciles from the Eastern Counties Institution, and Dr. Corfield points out the low resistance of such children to infections and to a fatal ending. There was a widespread epidemic of measles, with only two deaths, and Dr. Corfield attributes this result to the fact that parents have been educated by the health nurses to regard measles as a serious complaint. Whooping-cough, on the other hand, he says, is not treated seriously enough.

Hyde.

Dr. Nicolas Gebbie refers to the prevalence of pneumonia and respiratory infections and to the removal of the smoke cloud as the most important preventive measure. It will be noticed that Hyde is exceptional in having a three-figure infant mortality-rate, but a chart in the report shows that, whereas the infant mortality was just under 200 for the first five years of the century, it has been just under 100 during the last five years. The new maternity and child welfare centre, opened in June, is a valuable asset, says Dr. Gebbie, "and as a war memorial pays a worthy tribute to the men of Hyde who fell in the

Great War." Photographs and a plan of the building are included in the report. "The present rate of supply of houses in the borough is totally inadequate to meet present needs." Of 25 samples of milk examined for tubercle bacilli, three were found to be infected. In his school report Dr. Gebbie says there is a marked improvement in the general standard of cleanliness, but that inspections at frequent intervals are absolutely necessary to maintain the improvement. In July a committee of teachers arranged a visit to Wembley, and 353 children had to be examined by the medical officer; 51 per cent. of these showed evidence of successful vaccination. A few certificates were withheld on account of "nits" in the hair. The prospect of missing the trip and the energy of the school nurses in using Sacker combs at the clinic produced the desired result, and the withheld certificates were eventually granted.

Yeovil.

Dr. Charles W. Gee reports that the housing shortage still continues, and that a large number of houses are occupied by two or more families. The school care committee continues to provide from voluntary contributions much appreciated assistance

to necessitous children who do not come within the scope of the Poor-law. Dr. Gee says an open-air school is badly needed to deal with pre-tuberculous anæmic and debilitated children, and special classes in such a school for dull and backward children. "In the meantime playground classes should be utilised as much as possible."

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 25TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 65; scarlet fever, 1580; diphtheria, 868; enteric fever, 60; pneumonia, 606; puerperal fever, 44; cerebro-spinal fever, 4; acute poliomyelitis, 6; acute polio-encephalitis, 2; encephalitis lethargica, 50; continued fever, 4; dysentery, 5; ophthalmia neonatorum, 107. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 6 deaths from enteric fever, 44 from measles, 8 from scarlet fever, 39 from whooping-cough, 22 from influenza, and 29 from diphtheria. There were 64 deaths of children under 2 years from diarrhoea and enteritis, as compared with 50, 44, and 29 in the preceding weeks. In London itself there were 9 deaths from diphtheria; 6 from whooping-cough, and none from influenza.

Correspondence.

"Audi alteram partem."

SURGERY BEFORE LISTER.

To the Editor of THE LANCET.

SIR,—In your review of Sir William Watson Cheyne's "Lister and His Achievement," being the first Lister Memorial Lecture delivered at the Royal College of Surgeons of England on May 14th, you say: "There is no reader of our pages but knows what surgery was before Lister's time. . . ." This, I think, is questionable, and the difficulty is to enable the present generation to realise the state of affairs that existed at that period. Even those who experienced something of the fringe of its horrors are apt sometimes to forget the advantages we enjoy to-day and to neglect some necessary precaution, with the result that we are pulled up suddenly only to realise their importance by a calamity. Well do I remember my first visits to a surgical ward in one of the smaller hospitals nearly 35 years ago, where the newer methods of wound treatment had not yet taken root. The surgeon pulling on the silk ligatures which had to be left hanging from the end of an amputation stump was a familiar sight and the regular application of linseed meal poultices to a suppurating tuberculous hip with its sour, sickly-smelling discharge. The earlier stage of a similar case left a still more vivid impression, for I can still see the surgeon incising a tuberculous abscess without any precautions whatever—for he neither removed his coat nor bathed his hands—and inviting me out of the kindness of his heart, for he was a great teacher, to thrust my unwashed finger into the freshly opened abscess so that I might feel the eroded head of the femur!

I have been told that in the old Royal Infirmary at Newcastle there was a "condemned" ward into which post-operative cases were put after a first rigor which so frequently ushered in a fatal septicaemia, and that patients commonly died of septicaemia after such simple operations as amputation of the toe, and that severe sepsis after any operation meant many months of painful suffering often followed by permanently impaired health. As Osler said, only those who have lived in the pre-Listerian days can appreciate the revolution which has taken place in surgery. All students ought to read the story of "Rab and His Friends," by Dr. John Brown.¹ There they will find in beautiful language an accurate description of an old-time operation for removal of

the breast with the most wonderful picture of the after progress cruelly marred by the onset of a fatal blood poisoning—a name more embracing and expressive than those now commonly used. I can also strongly recommend "The Edinburgh School of Surgery Before Lister," by Alexander Miles, published by A. and C. Black. From it they will gather a vivid picture of operations in the earlier days and of the great men bold enough to perform them. But there is still room for some work describing the state of wound treatment just before Lister, and it should be done now while those who can most vividly write the story are still with us.

Of course, mention is often made of the conditions existing before Lister, but we require an exact description with some detail as much for educational as for historical purposes. I may be ignorant of what already exists, but the sort of work I have in mind should be easily accessible and suitable for student reading. It would supply a real want.

I am, Sir, yours faithfully,
Newcastle-upon-Tyne, July 31st. G. GREY TURNER.

THE ÆTIOLOGY OF CANCER.

To the Editor of THE LANCET.

SIR,—I think it ought not to be forgotten that ten years ago¹ Dr. A. S. Leyton and Dr. Helen G. Leyton isolated a streptothrix from sarcomata in rats and reproduced the disease in normal rats. Their procedure was briefly as follows: The press-juice from the tumour was passed through a porcelain filter, cultures were made from the filtrate, and the streptothrix grew. Rats were inoculated with the streptothrix and sarcomata reproduced. Acting on this brilliant piece of work Mr. W. Stevenson and I were able last year to cure a large sarcoma in a woman aged 38. The tumour was situated on the left side of the neck, and was so large that the patient's neck was turned to the right and fixed. Mr. Stevenson had reduced the tumour by about one-third of its bulk by radium. I then removed an intact piece of the tumour and obtained a profuse growth of diphtheroid bacilli (streptothrix). An antigen of this produced marked focal reaction in the tumour and general reaction. The tumour steadily retrogressed with the course of inoculations and completely disappeared. Some months later there was a recurrence in the glands of the left armpit from which I isolated the streptothrix again.

I am, Sir, yours faithfully,
University College, Dublin, July 24th. W. M. CROFTON.

To the Editor of THE LANCET.

SIR,—In your leading article of July 25th on the above subject you state "imagination can run on

¹ Reprinted in "Horse Subscivæ," second series (A. and C. Black), and in "Collected Short Stories," first series, "World's Classics" (Oxford University Press. 2s.).

¹ THE LANCET, 1916, i., 513.

almost indefinitely and in this case legitimately." With that before me, I venture to add to the flood of hypotheses with the hope that my addition thereto may not be regarded as illegitimately indefinite. I use, or it may be unwittingly pervert, the facts summarised in the Ministry of Health Memorandum (July, 1924) by Dr. J. A. Murray, by Dr. Mervyn Crofton in a paper¹ on Cancer, and the published work of Dr. A. Leitch.

There is no specific germ of cancer. The government of metabolism at sites in the animal body presumably varies in perfection, in accord with the grade of strain to which these are subjected in fulfilment of the respective functions subserved. Local irritation of mechanical, chemical, and toxic origin may be followed at certain sites by interruption of the sequence of processes of maintenance. In the human being more especially this may occur when these factors are aggravated by senescence and faulty dietetics. Independent of phagocytosis in the bloodstream, cell growth may be aided by ultra-microscopic microbes acting direct on effete matters, their influence on which may be restricted by toxic substances possessed by the healthy cell. In the presence of submaximal injury of cells as contrasted with their actual death, a struggle would ensue; in this the scavenger microbe may be at a disadvantage, toxic substances may gain the upper hand. When the process of irritation is chronic, the cells thus guarded would depend largely on physico-chemical processes (as illustrated in vitro experiments with fresh culture medium), and would assume a practically independent and insular existence with a scavenger service reduced to a minimum, if at all existent. Cells rich in toxin would guard the periphery. The toxic substance having fulfilled the function of protection locally might become surplus to requirements (as shown in the experiment in vitro of lack of growth in absence of fresh culture medium) and on entering the circulation would interfere with the scavenger microbe at the particular sites liable to overstrain in functioning, or owing to local irritation as defined above. Hence, there is no specific metastasis. On such an hypothesis cure of cancer would depend upon the judicious and intermittent flooding of the independent cell area (strictly within its confines) with the ultra-microscopic scavengers; in the endeavour to restore the balance of normal growth.

It seems to me that Dr. Gye's conclusion that *two* factors are necessary is met by this hypothesis, and is strengthened by the statement in the memorandum of the Ministry of Health that "the active agent behaves thus far like an ultra-microscopic virus, but it has not yet been possible to produce the disease with artificial cultures of it." (Italics not in the original.) You seem to approach the subject much from the same point of view I express when, in your leading article, you state, "It may turn out that the virus does not normally exist in the body at all, but is generated within it in something of the same relation to the cells as the bacteriophage has to the bacilli."

A further tendency in this direction is found in your mention of the doctrine of Drs. Gye and Cramer involving "defence rupture" (kataphylaxis). My hypothesis would, however, regard Dr. Gye's "particulate bodies" as scavengers whose presence under normal conditions stimulates the production of a defence toxin in proportion to the zeal permissible on their part. When Dr. Gye injects both the particulate body (his "virus") together with the toxin (his "specific factor") he imitates, presumably, in healthy tissue the circumstance of the struggle of the scavengers and the defence toxin in the metabolism incident to submaximal cell injury; and is successful in securing the results he desires, because from the start he handicaps the particulate bodies by upsetting the balance with toxin in excess to the normal of the site. In this view it would be premature to regard the particulate body as a virus. Having regard to the largely accepted local irritation

theory in causation of cancer, more light would be thrown on the subject were Dr. Gye's "virus" to be injected without his "specific factor" in tissue which recently has been subjected to submaximal injury.

This hypothesis may be *pour rire* when examined by experts; but I trust it will be regarded as quite as good as that which was accepted some time back as to the baneful effects of tomatoes in producing cancer!—I am, Sir, yours faithfully,

W. G. KING,

Hendon, N.W., August 3rd, 1925. Colonel, I.M.S. (Ret.)

To the Editor of THE LANCET.

SIR,—Dr. Gye's remarkable researches have aroused intense interest. They have a special interest to me through my association with the work, on lines very similar in theory, of my father, the late Dr. W. Ford Robertson. His paper¹ on the Relation of Carcinoma to Infections describes the result of inoculation of mice with cultures of an anaerobic diphtheroid bacillus isolated from five different human breast carcinoma and one rodent ulcer. He did not filter these cultures as he looked upon this bacterium, universally present under these conditions, as being probably the essential factor. Nineteen out of the 22 experimental mice were inoculated with pure anaerobic diphtheroid cultures in saline which had been subcultured from the primary broth into special anaerobic haemoglobin glucose agar for the purpose of enhancing purity of culture. On the two remaining mice primary cultures were used. In the light of Dr. Gye's work it would appear that Dr. Robertson deprived the inoculum of some of its virulence, for of the six positive experiments in the group, the resulting tumours did not appear until a lapse of from 9 to 23 months, while in the two cases where primary cultures were used (presumably containing besides the anaerobic diphtheroid bacillus a filterable virus) the period for tumour development was as short as two to three months.

Dr. Robertson's experiments are remarkable, in that out of a total of 22 mice which were inoculated with human cancer anaerobic diphtheroid cultures, without any specific substance, eight developed carcinomata and one sarcoma, and a further nine developed hyperplastic tumours strongly suspicious of malignancy (13 of these being examined and verified by the Laboratory of the College of Physicians, Edinburgh), making a total experimental production of 36 per cent. tumours of definite malignancy, and a further 41 per cent. of suspicious malignancy. Control mice to the number of over 30 were kept for longer periods during the experiments without developing any kind of tumour.

With regard to the specific substance this must have largely been removed by the technique adopted in the majority of Dr. Robertson's experiments, and further, only two mice were inoculated with cultures that might contain specific substance, the others being treated with pure surface subculture in saline, which presumably could not have contained this material. Tumours were produced, however, but in a relatively much longer period, suggesting that owing to the removal of specific substance or its destruction by secondary organisms, further time was required for its redevelopment in vivo, either by unknown toxic factors, the diphtheroid itself, or the virus incorporated with it.

I am, Sir, yours faithfully,

W. MARSDEN FORD ROBERTSON.

Southport, July 28th, 1925.

To the Editor of THE LANCET.

SIR,—There are probably few pathologists in this country who have not already read the most interesting papers on cancer and the ultra-microscopic viruses by Dr. Gye and Mr. Barnard. The work, moreover, has been widely discussed and the results and conclusions

¹ The Bordeaux Congress, 1924.

¹ Brit. Med. Jour., 1921, ii., 929.

appear to be accepted as correct by many pathologists. All, however, who wish well for the reputation of British medical science will be anxious lest an over-enthusiastic reception should blind workers to any possible sources of error which a more considered judgment might suggest ought to be thoroughly probed before a work of this nature is accepted as having been *proved* to be correct. Nothing could do greater harm to the reputation of British scientists that they should be shown to be in error, possibly in a year's time, by some worker in a foreign laboratory. I feel sure, therefore, that both Dr. Gye and Mr. Barnard will appreciate the desire of some workers to be given a little more information on several crucial points, a satisfactory answer to which would go a long way towards convincing those whose critical analysis of the results leaves them in some little doubt.

In view of the fact that ultra-microscopic viruses will tolerate pure glycerine and to a certain extent ether, is Dr. Gye convinced that his chloroform-treated filtrate is quite free from the virus or contagion? Might not a small amount of specific contagion be left and be made active by non-specific products, including acids present in what he believes to be his cultures, in the same way that toxins affect the virulence of bacteria? Can he give us some experiments conclusively disproving this possibility? How many times has the experiment given in Chart 5 been made, and has the result always been the same? Have large quantities of the same treated filtrate only been inoculated, as controls, with negative results? Have cultures of non-cancerous tissue been tested side by side with cultures of cancerous tissue when the same treated filtrate was added in each case? In making subcultures from the primary cultures have any comparative experiments been carried out with subcultures made after heating the *primary* culture to such a temperature that any virus would certainly be destroyed? Would a fifth subculture from this fail to be made active by a chloroform-treated filtrate which for certain made active the fifth subculture derived from the unheated primary culture? Such experiments giving clean-cut results would, I suggest, be considered weighty evidence by most pathologists who may not be quite convinced by the result given in Chart 11.

This investigation of Dr. Gye and Mr. Barnard must have a considerable effect on all investigations at present being carried out on the ultra-microscopic viruses, and it is of great importance to other workers that their own investigations shall be carried along the right lines. I am sure if Dr. Gye is in a position to give us the information I have suggested it will be of great assistance to, and will be appreciated by, those working in other laboratories.

I am, Sir, yours faithfully,
F. W. TWORT.

The Brown Institution, University of London,
July 20th, 1925.

To the Editor of THE LANCET.

SIR,—Dr. Gye's paper in your issue of July 18th, in which he reports the very important results of his experiments on the passage of the Rous chicken sarcoma No. 1, raises a point of interest which has been in my mind since I first knew of his preliminary work, and which acquires more importance in the light of his more recent results with mammalian tumours. The point concerns the second filterable fowl tumour referred to in his paper—chicken sarcoma No. 7, of the Rockefeller Institute—a tumour which I originally transplanted and passed by filtrates, and the details of which were first published—without my consent—under the names of Rous, Murphy, and Tytler.¹ This tumour I have described separately.²

The original of this tumour was an apparently inert, cartilaginous nodule on the keel of the sternum, and during the first few passages the growth remained

entirely benign in type—well encapsulated, cartilaginous during the first few weeks of growth, ceasing to grow after six to eight weeks, and then becoming more or less completely ossified, with the production of marrow spaces and blood-forming tissue. At about the fifth or sixth passage, however, it quite rapidly began to take on malignant qualities, and in the course of three or four passages became transformed into a soft, rapidly growing and invading, undifferentiated tumour, and at this stage I was able to pass it by means of a Berkefeld filtrate. The tumour passed out of my hands at this time, and for information as to its later course I was indebted to my former colleague, Dr. J. B. Murphy, from whom I understood that it acquired most of the characteristics of chicken sarcoma No. 1, to which it now bore a striking resemblance histologically, but always retained certain specific qualities of its own.

The point I wish to make, in the light of Dr. Gye's work, is the possibility that this originally benign tumour may have become infected by the active virus of chicken sarcoma No. 1. Numerous fowls bearing the latter tumour—many with large, extensively ulcerated growths—were being handled in the same laboratory, the danger of contagion was not at that time seriously considered, and we did not have the conception of a virus which could outlive the activity of the tissue preparations in use.

The suggestion is entirely speculative and impossible of confirmation, and would, indeed, have a very limited interest in connexion with the fowl tumour alone. But Dr. Gye's work leads us to hope, as I understand, with some justification, that he will be able to demonstrate the activity of his virus in the production of mammalian tumours, and to extend the results of his work to the whole field of malignant growths. In this case, the point I have raised may perhaps supplement in a small way the suggestion contained in his epoch-making work that contagion in cancer may be a factor of importance, a view which will no doubt appear revolutionary to the medical profession as a whole, as it does to me.

I am, Sir, yours faithfully,
W. H. TYTLER.

King Edward VII. Welsh National Memorial
Association, Central Tuberculosis Laboratory,
Cardiff, July 20th, 1925.

To the Editor of THE LANCET.

SIR,—It is a great pity that your leading article of July 25th did not appear in the same issue as Dr. Gye's communication. The communication was accompanied instead by a leading article which took a purely one-sided view of the question, accepting Dr. Gye's hypothesis as well as his facts, and even going beyond them in suggesting that the "specific factor" may be produced from irritated tissues, whereas Dr. Gye had produced it only from pre-existing tumours. Your article of July 25th took a more judicial attitude, and suggested that there might be another explanation of Dr. Gye's facts than his hypothesis of an extrinsic parasite, but, as far as I have seen, no notice of this second leading article has been taken by the daily press. The impression has thus been transmitted throughout the world that Dr. Gye has discovered the cancer parasite, and this impression is intensified by the unqualified support of the leading medical journal in the kingdom.

Pathologists are apt to ignore, or to regard with contempt, the views as to the constitution of living matter which are accepted by biologists. These views are that the cell is not the ultimate unit of life but is itself composed of different orders of smaller living units each of which is capable of growth and multiplication. Some of these units such as chromosomes, centrosomes, Golgi bodies, chondriosomes, &c., are visible under the microscope and their growth and multiplication can be studied directly. Others are invisible, but their existence is supported by very strong evidence.

According to Weismann the ultra-microscopic particles (determinants and biophores) are specific

¹ Jour. Amer. Med. Assoc., 1912, lix., 1793.

² Jour. Exp. Med., 1913, xvii., 466.

in character and determine the nature of the cells of which they form part. Since these views were first promulgated they have received remarkable independent confirmation in the facts of Mendelian heredity. There is little or no difference between Weismann's "determinant" and Mendel's "factor." Both are intercellular and ultra-microscopic, and capable of growth and multiplication. The "determinant" determines the nature of the cell and the "factor" determines the character with which it is associated. It appears to me that here we have an explanation which is in better accord with Dr. Gye's facts than his own hypothesis of an extrinsic cancer "virus."

Since cells can be cultivated under artificial conditions apart from the organisms of which they form part, there is no a priori reason why it should not be possible to cultivate these ultra-microscopic units apart from the cells. It appears to me that Dr. Gye's facts would be explained equally well on this supposition as they would be on his supposition that the "virus" is an extrinsic agent; and, for some of his facts, my suggestion offers the easier explanation. Cancer cells presumably contain an ultra-microscopic "factor" or "determinant" for cancer, and it is quite possible that Dr. Gye has succeeded in cultivating this factor, since he has not brought forward any evidence that his "virus" is an extrinsic germ.

The great majority of pathologists have always recognised that the known phenomena of cancer are incompatible with the theory of an extrinsic specific causal agent, and it does not appear that Dr. Gye's facts have removed the objections to this theory. To take one point only, it is now possible to induce cancer in animals without taking thought of any parasite. If an extrinsic parasite is to be considered necessary for the production of cancer, this organism must be present at all times either in all animals or else in the atmosphere. Otherwise it would be impossible to produce cancer without the specific introduction of the cancer parasite. There is, thus, very strong evidence in favour of the view that this so-called "virus" is not an extrinsic parasite, but is a constituent part of the cancer cell itself. This view is in accordance with the phenomena of cancer, whereas the hypothesis of an extrinsic agent is not. The question whether the virus is extrinsic in origin or is derived from the cancer cell itself is one of extreme importance, and it is much to be regretted that Dr. Gye's article was not submitted to more adequate criticism before being published, so that both sides of the question could have been presented to the public at the same time.

If my suggestion is correct, this work of Dr. Gye opens up vast possibilities in the way of cultivating Mendelian factors in vitro.

I am, Sir, yours faithfully,

CHARLES POWELL WHITE.

Manchester University, August 3rd, 1925.

To the Editor of THE LANCET.

SIR,—Dr. Gye's recent investigations have been of special interest to me, because I believe his virus will prove to be identical with the ultra-microscopic phase of the complex micro-organism which I described in 1921. This micro-organism I have obtained from a large number of cancers of all types. I have shown that the larger elements (coccal, bacillary, fungal) which soon appear in any ordinary culture medium containing a piece of cancerous tissue can be traced directly from minute elements, which emerge from the cells, or indirectly from an amorphous material, which escapes from the cells as globules and rods and which in this early stage is often curiously resistant to ordinary stains. This unstained "plasm" often first appears in and escaping from the dying cells as minute elements just on the verge of visibility. A study of these facts led me to write in 1922 that "the organism has, during its parasitic phase, acquired the faculty of

infecting individual cells and of living in a sort of symbiotic relationship with the cells which it inhabits. This conclusion . . . goes far to confirm the view which I advanced in a previous paper (1921) that the organism lives parasitically in a minute phase which is unrevealed by ordinary methods of staining." The globules and rods can sometimes be seen to emerge from the cells with a clearness that is diagrammatic. The organised forms (coccus, bacillus, yeast) often spring from refractile elements, which appear in and are detached from the globule and rod. Glover of New York and his colleagues have recently described a microbe which they have obtained from all types of cancer and whose general characters are similar to mine.

A remarkable feature of this micro-organism is that the alternative forms, although springing from one common stock, can pursue each an individual and stable life as coccus, bacillus, or yeast, and they may resist any efforts to change them, although I have frequently during five years' study convinced myself that under certain conditions any one form can pass over into any other form. These facts are foreign to ordinary bacteriological teaching and have made my views uncongenial to many bacteriologists, although there is a great deal of evidence in the literature to support them (Löhnis, Mellon, de Negri, Hort, Almquist, &c.). It is, I believe, apparent from the recent literature that fixity of form in bacteria is illusory as a criterion of specific characters, for as Löhnis, Mellon, I and others have shown the alternative phases of the same organism can often and probably usually pursue an independent true-to-type existence. It is sometimes urged that such a conception is opposed to the facts of biology. This is not so. It is opposed to much of the traditional teaching of bacteriology, but it is obviously in conformity with the great biological fact that a multitude of different cellular elements, each capable of independent propagation, are commonly derivable from one common germ-plasm. The further back we go in the world of life-forms the more we find the differentiated cell retains its multipotential characters of the original plasm. In the bacteria this retention would seem to be complete. The essential resemblance between the primitive bacterial matrix and the germ-plasm of higher life led me to name the former the bacterioplasm.

The first indications of these facts in regard to the cancer parasite came to me when I discovered that "plasm" rod or globule, minute granule or thread (in this stage strikingly similar to Rickettsia), bacillus or coccus could apparently, depending on the culture medium and other factors, be derived indifferently from the cells of the same piece of cancer. The confirmation of these facts came with the discovery that from the same "plasm" all the different forms were derivable. In this stage the refractile granule is a common index. During this phase the germinating "plasm" is easily mistaken for masses of debris to which the bacterial forms have adhered. As Löhnis has pointed out, in the past it has been commonly looked upon as dirt.

Sir, with the attention now being paid to the cancer parasite I look forward confidently to an early confirmation of these views first published in 1921. For long I have been urging that a similar reorientation of the bacteriological mind would probably quickly resolve the difficulties surrounding typhus, influenza, small-pox, &c. If it be true that Weigl, Breinl, and Fejgin have all succeeded in deriving the *Bacillus proteus* (X 19) commonly associated with typhus from the Rickettsia of typhus, we have the first augury of the unexpected facts which will transpire with the application of this broadened outlook. We can safely prophesy big developments along the same lines in the near future.

That familiar bacteria may possess a filterable phase is suggested by the work of Heymans (*B. anthracis*), Valtis, Vannucci, &c. (*B. tuberculosis*), Almquist (*B. typhosus*), Hort (*meningococcus*), and Löhnis. The very striking investigations of Löhnis

make it likely that all bacteria have a filterable mode of life; it may even be that this is the essential parasitic form of all bacteria.

I am, Sir, yours faithfully,

Edinburgh, August 1st, 1925.

JAMES YOUNG.

THE PRINCIPLES OF DYNAMIC PSYCHOLOGY.

To the Editor of THE LANCET.

SIR,—An opportunity, all too brief, occurred for the discussion of psychotherapy at the meeting reported in your last issue of the Medico-Psychological Association in Birmingham. Some of the opinions then expressed may be taken as typical of the progress the medical profession as a whole has made in the acceptance of the principles. Ten years ago it was difficult to obtain a hearing in medical circles for a paper dealing with the value of suggestion. The successes obtained during the war by the exponents of the Seale Hayne school and others, in the treatment of the conversion neuroses altered this, and the profession was bound to admit that suggestion had a definite therapeutic value. Having thus swallowed suggestion whole the profession appears inclined to rest there. If one may judge by the majority of practitioners one meets, the general attitude may be summed up by some such statement as this. "There are certain somewhat eccentric persons who have the power of curing neurotic conditions by suggestion, and there are certain nasty-minded cranks who believe that they can do good by means of a mystic ritual called psycho-analysis. Anyway, neurotic patients are a nuisance and if a bottle of bromide cannot satisfy them, let them go where they will."

There are those of us, Sir, who hold a different opinion. We say that considering the vast amount of misery, social and economic loss, caused by functional nerve disorders, the apathy of the profession, including most of its teachers, is nothing less than tragic. We know that suggestion at the best can do no more than remove some obvious symptom, and does nothing to enable the patient to adapt himself to his environment. It has no effect on phobias or anxieties, it will not cure the psychasthenic, or remove a tendency to criminal outbreaks. In order to treat such conditions as these one must have a knowledge of the workings of each individual patient's mind. One must recognise the existence of a dynamic Unconscious, and realise that the symptoms represent for each patient the satisfaction of some inner need, the solution of some unconscious mental conflict. We realise that an unhealthy body is not without influence on the mind. We do not minimise the importance of tracking down and eliminating all septic foci. We are aware that a dose of calomel may effectively purge melancholy, but we see too many individuals who have been subjected without benefit to every possible minor and major surgical procedure to believe that the root cause of a neurosis can be somatic.

Surely the time has come when students should not leave the medical schools without having learned something of the principles of dynamic psychology. Men when they go into practice will find themselves daily confronted with conditions which neither medicine nor surgery can solve. They will be consulted by women and men whom no examination, however thorough, will convince that they are not the victims of hidden cancer or tubercle. They will be asked to prescribe for adolescent girls who lose both appetite and sleep unaccountably. Healthy youths will present themselves with tales of woe which do not fit in with anything which the student has learned. These, as well as the readily recognisable hysteric and neurasthenic, will try his patience and waste his time and theirs, before taking their troubles elsewhere, unless he has the necessary psychological knowledge to deal with them. More important still, he will have many opportunities of dealing with the beginnings of neurosis in childhood, but he will pass them by.

The teaching I would advocate need not be definitely committed to the theories of either Freud, Jung, or Adler. Once imbued with the idea of the Unconscious as a dynamic force and not a lumber room, the interested student will pursue the subject on his own lines. I would emphasise, however, that as regards the lecturer, the terms neurologist and psychologist are not interchangeable, and it is for his psychological rather than his neurological knowledge that the lecturer should be chosen. An important part of the course would deal with the training of the young child, as it is during the nursery years that the foundations of most neuroses are laid, but something too would need to be said as to the part played in the anxiety states by the sex life of the adult. I am aware that post-graduate courses on these lines are in existence in some centres, but such lectures touch only the fringe of the profession. Such training as I advocate would at any rate enable the student in after life to recognise these cases when he sees them and enable him to advise treatment, even if he did not care to carry it out himself.

It is a mistake to think that there is no choice between neglect and a formal psycho-analysis. An astonishing amount of psychology can be dispensed over the counter, as it were, with lasting benefit to the recipients. Patients are frequently astonished, but never resentful of questions asked about their sex life, and show themselves extraordinarily grateful if the physician is able to point out where the shoe pinches. A varying amount of mental analysis is required in other cases and sometimes may be combined with suggestion, whilst in some other types the analysis must be carried to rock bottom. These last should be referred to recognised experts, but unless we train our students where are these experts to come from? Already this branch of therapeutics is overrun by men and women who have had no medical training. Some of them are honest and competent workers; others are not so, and bring disrepute upon a science which by its very nature arouses instinctive opposition. The value of psycho-analysis is freely recognised by educationists, the clergy are fully alive to its social uses; how long will the medical profession continue to turn the blind eye?

I am, Sir, yours faithfully,

Birmingham, August 4th.

R. MACDONALD LADELL.

PUBLIC HEALTH OF MARKET DRAYTON.

To the Editor of THE LANCET.

SIR,—I enclose report of a recent conference at Hales Hall (the rural dean in the chair) which throws some light on the causes of high infant mortality for some years past at Market Drayton, but does not solve the question, "Why does the Minister of Health steadily refuse to publish the report as to the high infant mortality at that little town, made by his own medical inspector last autumn?" We infer from a statement made by Dr. Wheatley, the M.O.H. for Shropshire, on May 9th, that "bad housing and ignorance" were the principal causes, and that "the health education" should begin in the elementary school (*Newport and Market Drayton Advertiser*, May 9th, 1925).

At the conference, reported in the issue of the same newspaper on July 25th, we gather that the medical inspector's report recommended more education, probably including the education of mothers at the infant welfare centre, and help for that centre. The report, we are informed, also stated that "the sanitary record is poor"; and it "suggested the appointment of a woman guardian." Surely this report should be published in full; the ratepayers should be told what improvements should be made in administration by the guardians which a woman guardian could assist; ignorance should be dispelled, the interest of the inhabitants enlisted, and the lives of the infants saved.

I am, Sir, yours faithfully,

August 4th, 1925.

J. THEODORE DODD, M.A., J.P.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

7, Great Marlborough-street, London, W.,
July 31st, 1925.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Bills Advanced.

ON Tuesday, July 28th, the Mental Deficiency (Amendment) Bill passed through Committee in the House of Lords, and the Dangerous Drugs Bill was read a second time. On the same day in the House of Commons the Diseases of Animals Bill was read a third time. On Wednesday, July 29th, in the House of Lords the Diseases of Animals Bill was read a first time, and the Summer Time Bill and the Dangerous Drugs Bill passed through Committee. On Thursday, July 30th, in the House of Lords the Diseases of Animals Bill was read a second time, the Public Health Bill was considered on report and certain minor amendments were agreed to, and the Mental Deficiency Amendment Bill was read a third time and passed. On Friday, July 31st, in the House of Lords the Public Health Bill was read a third time and passed, and the Pensions Bill and the Diseases of Animals Bill passed through Committee. Among a number of Bills to which the Royal Assent was given by Commission was the Mental Deficiency (Amendment) Bill. In the House of Commons on the same day the Lords amendments to the Therapeutic Substances Bill were agreed to.

HOUSE OF LORDS.

WEDNESDAY, JULY 29TH.

Indian Medical Services.

LORD SYDENHAM asked the Secretary of State for India whether measures were in contemplation adequately to fulfil the medical requirements of the Indian army, British residents, official and non-official, and the civil hospitals, and to secure the progress of medical science in all its branches throughout India. He said that we had conferred immense benefits upon the peoples of India by the introduction of Western medicine and surgery. Since Lord William Bentinck opened the Calcutta Medical College in 1835 the Indian Medical Service had grown to be one of the finest—perhaps even the finest—public medical service ever created. It had produced men who had won world-wide reputation, not only for research into the causes, the spread, and the prevention of diseases which afflicted India, but also for the fine work which had been done in educating the Indian students. While this service had always maintained a very high standard of health in the Indian army, to which it specially ministered, its achievements on the civil side had been most remarkable. The hospital system, which we introduced into India, had been spread broadcast over that country, and had been imitated in very many native States. The Indian Medical Service was in the strictest sense a key service, because it not only conserved the health of all the other British services, but it supplied the directive forces in all that might be called sanitation in India. The Indian Medical Service was crumbling away, and it had been necessary lately to send out medical officers on short contract, which was totally unsuitable to the conditions of India. It was essential that the medical officers of India should know the people and their languages and regard India as providing them with a career. This makeshift system could not possibly answer. In recent years there had been a great many inquiries into medical matters in India. The Royal Commission on the Public Services of 1912–15 in their report published in 1917, stated that the Indian Civil Medical Service was being economically and efficiently performed, which was undoubtedly true at that time. The Verney Lovett Report of 1919 proposed a unified service, to be called the Indian Medical Corps, the Indian Medical Service absorbing the R.A.M.C., and special provision being made for the discharge of the civil duties. The Esher Committee of 1919–20 declared that the Verney Lovett plan was the only feasible scheme of unification, but it decided that the amalgamation of the I.M.S. and the R.A.M.C. was at present impracticable. The Lee Commission of last year proposed that the R.A.M.C. should absorb the I.M.S.—which he

believed would give rise to a great many administrative difficulties—and that a civil branch should be created which would be 50 per cent. Indian recruited. The Report alluded rather ominously to the requirements of the provinces for a separate medical service. Those words seemed to show that there had been some political pressure brought to bear on the Commission, and he believed that the best British medical graduates would never join a medical service which would quickly become purely Indian whatever proportion they arbitrarily fixed. Under the Act of 1919 all the medical services were made a transferred subject and subsequently a boycott of the Indian Medical Service officers was set up.

India had produced a limited number of medical men of marked ability, and the subassistant surgeons, a class which we had created, had done much useful work, especially when under British supervision. But India had never shown the aptitude for Western medical science which had distinguished Japan. The ways of Western medical science had not yet won the full confidence of the Indian people, or even of all the educated classes, although Mr. Gandhi, who was the greatest protagonist of Indian methods, was not anxious to be operated on by an Indian surgeon. Vaid and Hakims were still numerous and influential, and they accounted annually for a considerable part of the mortality in India. The Ayurvedic and Unani systems, which were not really systems, were now being subsidised from public funds in some places, and this waste of public money was sure to be increased in the future. If the I.M.S. was not restored there would be a large reversion to indigenous methods, which would have a disastrous effect on the general health in India, and there would also be widespread corruption. India could not at present produce men capable of directing, teaching, and developing an exotic system of medicine and surgery, and besides that caste laws might, and very often did, interfere with the work of the Indian practitioner. Of the very large number of students turned out annually from our medical schools a considerable proportion never made any attempt to practise and many of them became politicians, while a few had specialised in bombs. So far as British men, women, and children in India were concerned they must all feel that it was the duty of the Government to provide them with medical assistance from men of their own race. The Lee Commission admitted this, and proposed to set up districts each possessing a European officer supported in whole or in part at the public expense. If the districts were made small enough this plan might work, but already in some cases great hardship existed through the great distances which separated British people in India from a British doctor. He did not forget the work of the medical missions, of which he saw a great deal. They also were bringing Western science to the people of India, and perhaps especially to the women of India who were in dire need of it. The difficulties in finding a solution of many of the present problems were very great in view of the hostility towards British officials, British methods, and British science, which had been generated in recent years. He disliked and distrusted centralisation, but he was convinced that the general control of any civil medical service in India, of medical education, and of medical research must be retained in the hands of the Imperial Government. Failing this there would certainly be a general reaction and a fatal lowering of standards in the whole administration of the medical services throughout India.

The EARL OF BIRKENHEAD (Secretary of State for India) said that the Indian Medical Service and its organisation had always been a question of extreme difficulty. It was at once a military and a civil medical service, and the interests of the two branches had not always been the same. The cardinal fact was that, generally speaking, the civil medical administration of India in the provinces, including the administration of hospitals, public health, and the provision for medical education, was a Provincial Transferred Subject under the Act of 1919, and the Secretary of State had divested himself of the powers of superintendence and control which he formerly exercised with regard to it. The Lee Commission, subject to certain limitations, took the same line with the Indian Medical Service as with the other all-India services dealing with transferred subjects. It appeared to them to be the logical and practical sequence of the reforms that, subject to the reservation of the rights of present members of the service, the provincial governments should in future recruit and control the services for whose work they were responsible to the Provincial Legislatures. In the case of the Indian Medical Service, however, the general principle was limited by two important considerations: first, the Civil Medical Service was the only source from which a medical reserve for the needs of the army, and in particular its requirements in trained British medical men, could be easily obtained in emergency; secondly, he had decided to adopt the recommendations of the Lee Commission for the provision for European services of medical attendance by British medical men. In the light of what he had said it would be clear that the Secretary of State would no longer undertake to recruit officers for the medical administration in

India generally or, in particular, for civil hospitals as such. Nor could he assume responsibility for the medical care of British non-officials resident in India. But the Act left as "Central Subjects," for which the Government of India were responsible, a number of matters, for instance, central agencies for research and technical training and the promotion of special studies, and a reserved responsibility in regard to legislation for infectious diseases and the regulation of medical qualifications and standards. For these the Secretary of State remained responsible, and he would continue to recruit officers to deal with them. He would also, of course, recruit for the civil medical needs of administrations that remained directly under the Government of India and for the Political Department. There remained for consideration the provisions to be made (1) for the army, including its medical reserve, and (2) for medical attendance on the European services as recommended by the Lee Commission. He had received the recommendations of the Government of India on these matters, and their consideration was already well advanced in his department. He was not yet in a position to communicate his final decisions, but he might, perhaps, indicate the lines on which he thought a solution of this difficult question would be found. The Lee Commission, with some hesitation, for they realised that military organisation lay outside their terms of reference, recommended that the military side of the Indian Medical Service should be absorbed in the Royal Army Medical Corps. The proposal had received very careful consideration from the Government of India and himself, and they had come to the conclusion that the solution proposed would raise many more difficulties on the military side than it would solve. They, therefore, thought that the Indian Medical Service must be maintained. It would be essentially a military service, but its reserve would be secured by lending officers to the civil administration. A consideration of the numbers in question went to show that the number of European officers in the reserve so lent would be sufficient to provide for the needs of the European services on the lines of the scheme proposed by the Lee Commission. These officers would be stationed at the headquarters of groups of districts throughout India, and would be made available for the European services and their families. The officers required by the Government of India for the central medical subjects would also be obtained from the Military Indian Medical Service.

It was, of course, a matter of the first importance whether a service constituted on these lines would attract recruits of the right class. He was inclined to think that it would be essential, with this in view, to reserve for the portion of the army reserve lent to the civil side but not required directly for the medical care of the British services, a number of civil appointments; for instance, research or professorial appointments. Such appointments had always been one of the attractions of the Indian Medical Service, and if the essential army reserve maintained in civil employment allowed a margin, as it almost certainly would, it was clearly a gain not only from the point of view of recruiting inducements, but a gain to Indian public health generally that they should be employed in the departments of research and teaching in which their predecessors had done so much for the welfare of India. His statement was necessarily tentative, for the final conclusion could only be reached after a careful balancing of the various interests involved, and, in particular, the claims of the Local Governments to the control of the provincial medical administration. But he was hopeful that a solution might be found on these lines, and that it would appeal to the medical profession. He was the more optimistic on the last point because, unlike certain other services, the Indian Medical Service was at present obtaining recruits of a high standard from the medical profession in this country, notwithstanding the uncertainty of the position pending his decision.

HOUSE OF COMMONS.

WEDNESDAY, JULY 29TH.

Appointment of Medical Service Chairmen.

Mr. MELLER asked the Minister of Health (1) what was the present procedure for appointing the chairmen of the medical service, the pharmaceutical service, and the joint services subcommittees of an insurance committee; whether such procedure had worked effectively since the inception of the National Health Insurance Act; and whether he had received any request from an insurance committee for amending the present regulations; and (2) whether he had received from the insurance committee for the County of London a representation protesting against the National Health Insurance (Medical Benefit) Amendment Regulations (No. 2), 1925, which provided for the appointment of the chairman of the medical service subcommittee by the Minister of Health failing the unanimous vote of the subcommittee, and that such member might not be a member of the insurance committee; and what action he proposed to take.—Sir KINGSLEY WOOD (Parliamentary Secretary to the

Ministry of Health) replied: Under the previous Regulations the chairman of the medical service subcommittee was required to be elected by the approved society representatives on the subcommittee and the medical practitioners appointed to be members of it, or in default of any selection by them by the neutral members of the insurance committee. No request for an amendment of the Regulations has been received from any insurance committee, but in London failure to find a chairman commanding the confidence of both parties led to the withdrawal of the medical representatives and the machinery for the investigation of complaints was brought to a standstill. A similar situation has arisen recently in Southampton. The amending regulations of July, 1925, arose out of the difficulty in London, and represented a settlement which my right hon. friend understood to be acceptable to both parties to the dispute. My right hon. friend has recently received representations from the London Insurance Committee against the new regulations, but he can see no other method of preventing the recurrence in future of a deadlock which is prejudicial to the administration of medical benefit and to the interests of insured persons.

THURSDAY, JULY 30TH.

Pensioners Medical History Précis.

Mr. HAYES asked the Minister of Pensions whether, in cases of appeal by a widow or orphan children of an ex-Service man whose medical history disclosed venereal disease, he would sanction the omission of all reference thereto from the précis sent to the widow or other appellant when such disease had no relationship to the cause of death.—Major G. C. TRYON replied: It has been the consistent policy of the Ministry, reinforced by repeated representations, to make a précis in a case of appeal a complete statement of the man's medical history as known to the Ministry, in order that the tribunal may have before it precisely the same and as full information as that on which the Ministry came to their decision. The Ministry are not in a position to determine the view which the tribunal may take as regards the connexion between the cause of death and any other disease of which there is evidence in the man's medical history. The case for presenting a complete statement to the tribunal is in my view so important that I could not authorise any exception to the rule.

Veterinary Inspection of Dairy Herds.

Mr. MACKENZIE LIVINGSTONE asked the Minister of Health what local authorities now carried out veterinary inspection of dairy herds.—Mr. NEVILLE CHAMBERLAIN replied: A few of the sanitary authorities in England and Wales systematically carry out veterinary inspections of dairy herds, and I believe that most sanitary authorities have made arrangements for obtaining the services of a veterinary surgeon for the inspection of cattle where occasion demands.

Industrial Hygiene.

Colonel WOODCOCK asked the Minister of Labour whether any effect had been given to the unanimous resolution of the conference of the International Labour Organisation, Washington, 1919, that an advisory committee on which the governments, the employers, and the workers should all be represented, should be appointed without delay to keep in touch with the work of the health section of the International Labour Organisation.—Mr. BETTERTON (Parliamentary Secretary to the Ministry of Labour) replied: So far as I have been able to ascertain up to the present the only committee appointed as a result of the Washington resolution to which my hon. and gallant friend refers is the Correspondence Committee on Industrial Hygiene. That Committee, however, consists of experts and not as laid down by the Washington resolution of representatives of governments, employers, and workers.

TUESDAY, AUGUST 4TH.

Deaths from Small-pox.

Mr. BROAD asked the Minister of Health whether the Registrar-General would revise his figures for 1924 in regard to small-pox deaths, in the light of the information given in the recent Report of Sir George Newman, in which five of the small-pox deaths were transferred to other classifications, it being the opinion of the certifying doctor that small-pox was not the cause of death.—Mr. NEVILLE CHAMBERLAIN replied: I understand that in the case of all the deaths in question small-pox is certified by the certifying doctor as being one of the causes of death. In such cases the selection from among several certified causes of the particular cause under which the death is classified for statistical purposes is governed by general rules, based upon international agreement, which in this country provide that deaths should be classed to small-pox if this disease is included among the certified causes. I see no reason for revising the classification in the case of these particular deaths, especially since full information regarding them is already given in the chief medical officer's report.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary quarterly Comitia of the College was held on July 30th, the President, Sir Humphry Rolleston, being in the chair. The minutes of the Censor's Board were read. The following successful candidates were admitted as Members:—

Drs. Henry K. Bates, Robert H. Baxter, John Brander, Edward A. Carmichael, Peter Connan, John H. Dunn, Edward Gallop, Humphry H. Gleave, Frank D. Howitt, Redvers N. Ironside, Victor J. F. Lack, Reginald C. Lightwood, James L. Livingstone, Neville L. Lloyd, George L. Lyon-Smith, Bruce Maclean, Cyril C. W. Maguire, Frederick H. Moran, Bernard E. Schlesinger, John S. Sloper, Harry L. Stokes, Robert Y. Stones, Samson Wright, and Harry W. Wunderly.

The following College officers, members of committees, and examiners were elected for the ensuing year:—

Censors.—Sir John Rose Bradford, Dr. Cyril Ogle, Dr. James Calvert, and Dr. Robert Hutchison.

Emeritus Treasurer.—Sir Dyce Duckworth.

Treasurer.—Dr. Sidney P. Phillips.

Registrar.—Dr. Raymond Crawford.

Harveian Librarian.—Dr. T. H. Arnold Chaplin.

Members of the Library Committee.—Dr. Frederick Parkes Weber, Dr. Herbert Spencer, Dr. William C. Bosanquet, and Dr. Charles J. Singer.

Curators of the Museum.—Dr. John Mitchell Bruce, Sir Seymour John Sharkey, Sir Frederick W. Andrewes, and Dr. William Hunter.

Finance Committee.—Dr. Arthur George Phear, Dr. John Fawcett, and Dr. Frederick J. Poynton.

Examiners.—Chemistry: Dr. Robert H. A. Plimmer and Dr. William H. Hurley. Physics: Dr. William E. Curtis and Dr. Sidney Russ. Practical Pharmacy: Dr. Edward A. Cockayne, Dr. Nathan Mutch, Dr. Alfred J. Clark, Dr. Hugh Gainsborough, and Dr. Orlando Inchley. Physiology: Dr. John B. Leathes and Dr. John Mellanby. Anatomy: Dr. G. Elliot Smith. Medical Anatomy and Principles and Practice of Medicine: Dr. H. Morley Fletcher, Dr. Arthur G. Phear, Dr. William C. Bosanquet, Dr. James W. Russell, Dr. Charles R. Box, Sir James Purves-Stewart, Dr. Lewis A. Smith, Sir John C. Briscoe, Dr. Charles E. Lakin, and Dr. James A. Torrens. Midwifery and Diseases peculiar to Women: Dr. Cuthbert H. J. Lockyer, Sir Ewen J. Maclean, Sir Henry J. F. Simson, Dr. William Gilliatt, and Dr. Stanley Dodd.

Examiners in Public Health.—Part I.: Mr. John H. Ryffel. Part II.: Dr. David S. Davies.

Tropical Medicine.—Sir Percy W. Bassett-Smith (Bacteriology); Sir Leonard Rogers (Diseases and Hygiene of the Tropics).

Ophthalmic Medicine and Surgery.—Dr. James S. Collier.

Psychological Medicine.—Part I.: Dr. Eric D. Macnamara. Part II.: Dr. Robert P. Smith and Dr. C. M. Hinds Howell.

Laryngology and Otolaryngology.—Sir St. Clair Thomson.

Licences to practise Physic were granted to the following candidates, who have passed the Final Examination of the Conjoint Board, and are now entitled to receive the conjoint diploma:—

Ahmed K. Abdel-Khalik, Cairo; Geoffrey N. M. Aitkens, Charing Cross; John S. Aldridge, St. Bart.'s; David R. Allison, Leeds; Roland G. Anderson, St. Bart.'s; Colin B. Andreae, Guy's; Reginald Armsden, Univ. Coll.; Humphrey M. H. Ashwin, Sheffield and Guy's; Edward A. Aslett, St. Mary's; George S. Aston, Birmingham; Harold Awwounin, Charing Cross; Herbert M. Ayres, St. Thomas's; Edward Bacon and Harold I. C. Balfour, St. Bart.'s; Douglas E. Barton, St. Mary's; George F. G. Batchelor, St. Andrews; Ralph M. Bates, London; *Sybil K. Batley, Royal Free; Cyril E. Beare, Middlesex; John G. Y. Bell, King's Coll.; Stanley A. Belshaw, Cambridge and Middlesex; *Jane G. Bevan, Westminster; Suryasen N. Bhansali, Bombay; Shankar S. Bhatnagar, Punjab and Middlesex; Charles A. Birch, Liverpool; Hugh M. Birch, Adelaide and London; Frank H. Blackburn, Durham; Norman W. Bolton, Manchester; *Edith D. Bowie, King's Coll.; Harry C. Boyde, St. Bart.'s; Clarence S. Broadbent, Oxford and Leeds; *Theodora Brookes, Royal Free; Abraham S. S. Brown, Cape and Liverpool; James A. S. Brown, Cambridge and London; James L. Brown, King's Coll.; Thomas E. Brown, Cape and St. Thomas's; Oglethorpe W. B. Browning, Univ. Coll.; Harold H. Bullough, Manchester; *Eleanor G. Burdett, Royal Free and St. Mary's; Richard C. L. Burges, Cambridge and Birmingham; Thomas J. Burke, Charing Cross and Cardiff; John W. D. Buttery, Cambridge and St. Bart.'s; *Avie R. H. Cama, Bombay and Royal Free; Frederick F. R. Carreck, St. Mary's; Ferdinand Carroll, Madras and St. Mary's; John H. T. Challis, London; *Irene E. Chandler, King's Coll.; *Gwendolen S. Chataway, Royal Free and St. Mary's; *Eileen A. Chennell, St. Mary's; *Ella J. Cockram, Oxford and King's Coll.; *Marian B. Coleman, Royal Free; Arthur C. Copley, Cambridge and Guy's; *Celia M. M. Culver-Evans, Royal Free; *Evelyn J. Curtis, King's Coll.; George W. Curtis, Birmingham; Robert S. Davidson, Manchester; Alfred Davies, Cardiff and Middlesex; Cyril I. Davies, London; Harry G. Davies and Llewellyn Davies, Guy's; Vincent H. G. Davies, Cardiff and Middlesex; George H. Day, St. Bart.'s; *Doris L. Delittle, Westminster; Norman A. Dickinson, Manchester; Frederick R. Dingle, Guy's; Charles Donald,

Aberdeen; Lawrence Earlam, Liverpool; Robert G. Eastwood, Leeds; Richard W. Edwards, Cardiff and Guy's; Abd el Kader H. El Shurbagi, Cairo and St. Thomas's; Horace Evans, London; Ivor Evans, Cambridge and St. Thomas's; Thomas F. Everett, Cambridge and Middlesex; Harold E. Filmer, Guy's; Marcus Fine, Cape and London; John W. Fisher, St. Mary's; Maurice Fishman, St. Bart.'s; Arthur H. W. Fleming, Manchester and Middlesex; *Elsie C. I. Foeke, Royal Free; Ambrose J. Foote, Oxford and London; Ernest A. Freeman, St. Bart.'s; Leslie O. F. Fysh, Oxford and London; Joel Gabe, Westminster; Wilfrid F. Gaisford, St. Bart.'s; Eric A. Gerrard, Manchester; *Winefride M. Gibson, Charing Cross; Reuben Glasser, Cape and Liverpool; Aaron Glatt, Liverpool; Eric H. Glynn, Cambridge and Liverpool; Thomas R. Goddard, Univ. Coll.; Joseph Goldberg, Cape and London; Walter L. Gopsill, St. Thomas's; James Gore, Birmingham; *Edith L. Gould, Royal Free; *Gladys Goument, Royal Free and St. Mary's; Sydney J. P. Gray, Cambridge and St. Bart.'s; Howard L. H. H. Green, Cambridge and London; *Emily M. Hall, St. Mary's; George T. Hankey, Guy's; Maurice J. Harker, Cambridge and St. Bart.'s; Cecil G. Harper, Middlesex; *Helen M. Harris, Royal Free; *Constance E. Harrison, London; Leslie F. A. Harrison, St. Bart.'s; John W. Hart, Univ. Coll.; Farid Y. Hasaballa, Cairo and St. Thomas's; William D. Hasler, Middlesex; Benjamin E. Hawkins, Guy's; John C. Heal, Liverpool; *Lynette Hemmant, Cambridge and King's Coll.; *Dorothy G. Hervey, Birmingham; *Kathleen L. Hicks, Univ. Coll. and St. Mary's; Charles H. Highfield, Guy's; Gerald S. Hirst, Leeds; Chee H. Ho, St. Thomas's; Bernulf L. Hodge, St. Bart.'s; Simon J. Hoffman, Cape and Middlesex; Richard St. J. Honner, Sydney and London; Charles L. Hunt, St. Bart.'s; David J. C. Hutton, Middlesex; Stuart W. Innes-Smith, Edinburgh and Sheffield; Adangapathoo O. Jacob, Madras; Trevor L. Jenkins, Cardiff and Middlesex; Emrys Jones, Guy's; *Helen V. Jones, Cardiff; and St. Mary's; Iorwerth H. Jones, Charing Cross; *Morfydd R. Jones, Royal Free; Thomas S. L. Jones, Liverpool; George W. Keele, Univ. Coll.; John J. Keevil, Cambridge and St. Thomas's; *Frances M. Kenyon, King's Coll.; Arthur K. Kerr, St. Bart.'s; Bernard Kornblum, Warsaw and Guy's; Otto F. A. Krause, Guy's; Edgar D. Lawrence, St. George's; Henry E. Lewis, Guy's; William E. Lishman, Liverpool; *Dorothy M. Llewellyn, Westminster; Thomas R. E. Longton, Liverpool; Edmund S. S. Lucas, St. Thomas's; William S. Macgowan, Middlesex; Colin C. Mackinnon, Middlesex and Bristol; *Aileen I. McMahon, Charing Cross; Ian McPherson, Middlesex; Malcolm L. Maley, St. Bart.'s; *Joan G. Malleson, Charing Cross; Wilfrid N. Maple, St. Thomas's; Hugh L. Marriott, Middlesex; Colin H. Mason, Calcutta and St. Mary's; Alexander K. Miller and Nathaniel A. Miller, St. Thomas's; Hugh P. F. Modder, Ceylon and St. George's; William J. Moody, Cambridge and London; Arthur L. Moorby, King's Coll.; Reginald H. Mortis, Charing Cross; Kavasseri V. N. Nair, Madras and London; William B. Norcott, Guy's; *Kathleen G. Norton, Oxford and St. Mary's; Bryan V. O'Connor, Oxford and Middlesex; *Gwynedd M. E. Olive, Royal Free; *Edith G. Peacock, Charing Cross; Robert W. L. Pearson, Cambridge and Liverpool; Harry Peaston, Liverpool; Kudateligé R. T. Peiris, Ceylon and King's Coll.; Alfred B. Plant, Guy's; William G. Platt, Leeds; George L. S. Plumbly, Univ. Coll.; Stephen M. Power, London; Isaac Price and *Nora Proctor-Sims, King's Coll.; Trefor B. Prys-Jones, Cardiff and Middlesex; *Violet R. H. Rains, King's Coll.; Jacob Raisman, Leeds; James R. Ratcliffe, Guy's; Mysore P. S. Rau, Madras and Middlesex; John E. Readman, Manchester and London; Eric W. Riches, Middlesex; James B. W. Robertson, Cambridge and St. Bart.'s; *May E. Rogers, Royal Free; James C. Ross, Liverpool; George L. F. Rowell, Cambridge and St. Bart.'s; Enrique A. Rucker, Middlesex; Hubert Scudamore, Cambridge and London; Adolph Sebba, London; Herbert J. Seddon, St. Bart.'s; Stewart Q. Servanté, Middlesex; Joseph Shepherd, Univ. Coll.; Jonathan Shutt, Leeds and London; *Amelia M. Simmons, Charing Cross; John H. Simmons, King's Coll.; John A. Simons, Guy's; Alexander Simpson-Smith, Cambridge and Guy's; Eric G. Smallbone, Guy's; *Rachel M. S. Smellie, St. Mary's; Reginald H. Smith, Manchester; Richard K. Smith, St. Bart.'s; Simon Speck, Middlesex; Leopold P. Spero, St. Mary's; *Lois Stent, Manchester; Thomas W. Stephens, Cape and St. Thomas's; James M. Stobo, Glasgow and London; Richard Stuart, St. Bart.'s; Frederick W. Ta'Bois, London; Alan C. Taylor, Guy's; Geoffrey F. Taylor, King's Coll.; William A. Taylor, London; *Josephine I. Terry, St. Mary's; Daniel E. Thomas, Cardiff and St. Bart.'s; John E. Thomas, Cardiff; John L. Thomas, Cardiff and Middlesex; Frank S. Thornton, St. Thomas's; Frederick T. Thorpe, Birmingham; Oscar C. Tobin, London; Harold Trafford, Guy's; *Beatrice E. Turner, Royal Free; Kavas A. Turner, Bombay and Leeds; Leo G. W. Urich, Middlesex; Johannes N. J. L. Uys, Cape and St. Thomas's; Philip R. Viviers, Cape and St. Bart.'s; Arthur G. Walter, Cambridge and St. Thomas's; *Elizabeth M. Whishaw, St. Mary's; Ivor E. Whitehall, Univ. Coll.; John S. Whitten, St. Bart.'s; John M. Wilder, London; Edward C. P. Williams, Middlesex; *Ellis J. Williams, Cardiff; Gwilym O. Williams, Cardiff and Liverpool; Herbert J. Williams, Birmingham; John H. Williams, London; William B. Williams, Charing Cross and Cardiff; John H. Willis, London; Norman Wilson, Univ. Coll.; Richard E. Wolfendale, Manchester; Clarence J. Wyld, Bombay and Guy's; Robert H. Yelf, King's Coll.; and Thomas Yoxall, Birmingham.

* Under the Medical Act, 1876.

The undermentioned diplomas were granted, jointly with the Royal College of Surgeons of England, to the following successful candidates:—

Diploma in Public Health.—Charles O. S. B. Brooke, Dorothy M. Campbell-Meiklejohn, John V. Carroll, Joseph Cauchi, Edward T. P. Eames, David G. M. Edwards, John C. N. Harris, Stafford S. Hewitt, Alice E. D. Kam, Burjor F. Khambatta, Chandu V. Ramchandani, Bisheshwar P. Srivastava, Doris M. Stone, and Frederick Tooth.

Diploma in Tropical Medicine and Hygiene.—Ahmed F. Abbassi, Mohamed Ali, Donald D. Anderson, John B. S. Baxter, John C. R. Buchanan, Matthew Burn, Angus H. Campbell, Robert A. Chambers, William Corner, John R. Davies, Gilbert H. Dive, Ibrahim Girgis, Francis M. Halley, Hans-Raj, George W. Harley, Alan McKenzie, Mir S. Mahmood, William J. Moir, Charles R. Philip, Louis M. J. R. Pilot, Sundramier Ramakrishnan, Hugh D. C. Rice, George W. Scott, Edward A. Seagar, Timothy F. Sheehan, Charlotte A. Stuart, Clement Sturton, and W. Wilkinson.

Diploma in Psychological Medicine.—Geoffrey T. Baker, George L. Cutts, Henry T. Jones, John J. Laws, John B. S. Lewis, Hugh C. McManus, Andrew H. Pearce, Gordon F. Peters, Reginald G. Riches, Gerald R. A. de Montjoie Rudolf, and John Russell.

Diploma in Ophthalmic Medicine and Surgery.—Edward W. Arndt, Harnand L. Batra, Kashinath D. Bhave, Catharine Boyd, Martin M. Cruickshank, Arthur W. D'Ombrian, Agnes Esteourt-Oswald, James A. F. Flynn, Kenneth B. Johnston, Wajid Ali Khan, Coimbatore V. Krishnaswami, Arthur P. Lawrence, Arthur L. McCurry, William M. C. MacDonald, Kizhakkekalattil K. Nayar, Kaikhushru B. Palkhivala, and Reuben W. Payne.

Diploma in Laryngology and Otology.—Sek Nin Chau, Edward D. D. Dickson, Robert McM. Glynn, Ronald E. Jowett, Jean P. Kies, Norman W. MacKeith, and John H. Shaw.

By-law 112, relating to the age of candidates for the Membership, was altered to read as follows: "Every candidate for the Membership shall furnish proof of having attained the age of 23 years."

The Baly Medal was awarded to Prof. R. Magnus, of Utrecht, on the recommendation of Council.—The President announced that he had appointed Sir John Rose Bradford to deliver the Harveian Oration in 1926.—A report was received from the Representative of the College on the General Medical Council concerning the proceedings of the Council at their session held in May and June last.—A report was received, dated May 29th, 1925, from Dr. Gordon Holmes, Representative of the College at the Charcot Centenary in Paris.—A report was received from Sir Percival Horton-Smith Hartley, Representative of the College at the Eleventh Conference of the National Association for the Prevention of Tuberculosis on July 6th and 7th.—A report was received from Dr. Dawtrey Drewitt, the Representative of the College on the Chelsea Physic Garden.—Sir Frederick Andrewes was reappointed a Representative on the Executive Committee of the Imperial Cancer Research Fund.—A report was received from the Committee appointed to revise the by-laws and regulations relating to the examination for the Membership.—After some further College business of formal nature, the President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council of the College on July 30th, Sir John Bland-Sutton, the President, in the chair, Prof. Alexander Primrose was admitted a Fellow of the College, Mr. Evelyn Sprawson was re-elected a Member of the Board of Examiners in Dental Surgery, and Sir D'Arcy Power was re-elected a Member of the Executive Committee of the Imperial Cancer Research Fund.—The terms of a petition for a supplemental charter were taken into consideration and approved, and it was decided that the further steps to be taken in the matter should be considered at the quarterly meeting of the Council in October. The proposed supplemental charter is, in general terms, to enable the Council to make improved arrangements for certain examinations. In accordance with this subject it is proposed to give the Council power to increase the number of members of the Court of Examiners and to give greater freedom in the selection of examiners for the Licence in Dental Surgery. It is also proposed to admit women Fellows and Members of the College and Licentiates in Dental Surgery on the same terms and conditions as men and with the same rights and privileges and to effect certain minor adjustments.—The diploma of Fellow was conferred upon the following three candidates who have now complied with the necessary by-laws: Drs. John P. Hosford, Alec A. Lees, and Donald E. Ross.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the undermentioned subjects:—

Surgery.—S. J. Alexander, Sydney and St. George's Hosp.; S. Bartlett, Liverpool; F. Beinasczewitch, Berne; F. Carroll, St. Mary's Hosp.; W. Hinds, Durham; and P. H. Knowles, Bristol.

Medicine.—S. Bartlett, Liverpool; F. T. Birkinshaw, Univ. Coll. Hosp.; A. H. Henson, Charing Cross Hosp.; A. Kaplan, St. Mary's Hosp.; T. A. Lazaro, St. Bart's Hosp.; C. H. Mason and C. S. Netscher, St. Mary's Hosp.; R. C. Pratt, Birmingham; and K. E. R. Robertson, St. Mary's Hosp.

Forensic Medicine.—S. Bartlett, Liverpool; T. A. Lazaro, St. Bart's Hosp.; R. D. Mason, St. Mary's Hosp.; P. B. P. Mellows, St. Bart's Hosp.; J. M. Moran, Manchester; and K. E. R. Robertson, St. Mary's Hosp.

Midwifery.—S. Bartlett, Liverpool; S. A. Joelson, London Hosp.; C. H. St. Johnston, Birmingham; J. Mindess, London Hosp.; J. M. Moran, Manchester; and P. H. Row, London Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: S. J. Alexander, S. Bartlett, F. T. Birkinshaw, F. Carroll, A. Kaplan, P. H. Knowles, C. H. Mason, C. S. Netscher, and K. E. R. Robertson.

The Royal Free Hospital has received a gift of £2000 from an anonymous donor for the enlargement of its light treatment department.

KING'S COLLEGE HOSPITAL.—In 1922 the scholars and staff of the Mary Datchelor girls' school at Camberwell raised £650 in connexion with the London Schools' Hospital Fund towards the £1000 required for the endowment of a bed in King's College Hospital. The fund has now been completed and last week the Bishop of Kingston dedicated the bed. In 1912 the old girls endowed a cot at the hospital.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The Commission, having held 40 meetings at weekly or shorter intervals since October last for the hearing of oral evidence, have now adjourned until October next, when the final evidence from representatives of the Government departments will be taken, after which the Commission will proceed to consider their report. Proof copies of the oral evidence and the relative statements submitted at the meetings of June 25th (3s.) and 30th, and July 2nd and 7th (each 2s. 3d.), as well as Volume II. of the Minutes of Evidence, covering the period from Jan. 15th to March 26th (12s. 6d.), are on sale at H.M. Stationery Office.

TUBERCULOSIS IN WALES.—The Board of Governors of King Edward VII. Welsh National Memorial Association for the Prevention, Treatment, and Abolition of Tuberculosis met for the first time since its formation in 1912 for its annual meeting at Bangor on July 30th. The President stated in his opening address that English local authorities were being treated more generously than the Welsh Association. The Association had provided 1400 beds at an average cost of £322 per bed, including the cost of X ray installations, operating theatres, and other necessities. Treasury grants had not amounted to more than £166 per bed, while the Corporation of Manchester for its tuberculosis scheme would receive, he said, grants at the rate of £525 from the Treasury. The annual statistics of the work of the Association during the past year showed that the number of people examined at the dispensaries and visiting stations was not quite so large as in the preceding year. During last year in hospitals or sanatoriums, 4480 patients were treated. The Association now had 1400 beds in their own institutions. In 1911 there were 3663 deaths from tuberculosis in Wales and Monmouth, and in 1924 the number was 3189, while the population in that period had increased by 300,000—i.e., for every million persons living in Wales and Monmouth in 1911 there were 1513 deaths from tuberculosis, while in 1924 the deaths per 1,000,000 numbered 1169. In the five westernmost counties—Pembrokeshire, Cardiganshire, Merionethshire, Carnarvonshire, and Anglesey—the death-rate per 1,000,000 persons in 1924 was 1664. In the other eight counties the rate was 986. The need for more beds, particularly for persons suffering from surgical tuberculosis, was strongly emphasised. Mr. J. C. Townley emphasised the incidence of tuberculosis in the three western counties, Merioneth, Cardiganshire, and Carnarvon. The contrast in the death-rates from tuberculosis was most marked between the eastern and western counties and even between the east and west districts of the counties themselves. In Carnarvon the deaths from tuberculosis ranged from 6 per 10,000 in Conway rural area to 28 in Gwyrfa and 26 in Glasfryn. In the part of Montgomeryshire which bordered Merioneth the rate was 6, while in the adjoining rural area of Dolgelly in Merioneth it was 14, and farther west it was 19. Colonel Lyle Cummins, the principal medical officer of the Association, said one satisfactory feature in relation to the three counties was that, while their mortality from tuberculosis started higher than other counties, the decline in the death-rate had been as pronounced as in the remainder. Several theories had been propounded to account for the greater susceptibility of the western counties to tuberculosis,

including the prevalence of rain-bearing winds, especially westerly winds. Another suggestion was that people living in isolated districts had a lesser power of resistance than those living in congested town areas, where they became more immune from attack and their resisting powers increased.

DUBLIN: POST-GRADUATE CLASSES.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 14th, to Saturday, Oct. 3rd. Members of the class can reside in college rooms and dine on commons.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Queen Mary's Hospital will hold a general course in Medicine, Surgery, and the Special Departments from August 24th to Sept. 5th. Daily sessions will be held from 10.30 A.M. to 5 P.M., including demonstrations of clinical methods, groups of illustrative cases, &c. A special feature of the course will be the opportunity for practical study in gynaecology and obstetrics.—A variety of special courses will be held during the month of September. From the 7th, continuing for five weeks, will be given an Operative Surgery course arranged by the Seamen's Hospital, the meetings taking place four times weekly.—On Sept. 21st the Brompton Hospital begins a two weeks' course dealing with Pulmonary Diseases from all aspects.—There will be an afternoon course with evening V.D. clinics at the Blackfriars Skin Hospital from Sept. 7th to 19th.—The same date has been chosen for a course to take place at the Infants Hospital. A special feature of this is the instruction available in all the latest methods employed for dealing with infant ailments, and facilities are provided for visits to centres away from the hospital.—The Royal Westminster Ophthalmic Hospital has fixed a course from Sept. 7th to 26th, consisting of instruction in the out-patient department and special lectures and demonstrations dealing with Diseases of the Eye.—There will be an intensive course in General Medicine, Surgery, and the Specialties at the Westminster Hospital from Sept. 21st to Oct. 3rd.—Dr. C. B. Heald has undertaken a series of lecture-demonstrations in Electro-therapy, on Wednesdays, beginning Sept. 23rd, at the Royal Free Hospital.—Copies of the syllabus of each of the aforementioned courses, together with the general programme of the Fellowship of Medicine, can be obtained from the Secretary to the Fellowship at 1, Wimpole-street, London, W. 1.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 10th, to SATURDAY, August 15th.—**PRINCE OF WALES'S HOSPITAL, Tottenham, N. (N.E. London Post-Graduate College).** Intensive Course in General Medicine, Surgery, and the Special Departments. Sessions 10.30 A.M. to 5.30 P.M., except Saturday (second week).—**ALL SAINTS HOSPITAL, Vauxhall Bridge-road, S.W.** Special Course in Urology, consisting of clinical instruction and special lecture on subject.—**WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street.** Lecture-demonstrations illustrated by cases at 5 P.M. Monday, Dr. L. R. Yealland on The Varieties of Muscular Atrophy. Tuesday, Dr. Hildred Carllill on The Reflexes in Health and Disease. Wednesday, Mr. C. Wakeley, on Cerebral Surgery. Thursday, Dr. E. D. Macnamara on The Sequelae of Encephalitis Lethargica. Friday, Dr. C. Worster-Drought on Diagnosis and Treatment of Syphilis of the Nervous System.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 10th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 3 P.M., Dr. Saunders: Medical Wards.

TUESDAY.—11 A.M., Dr. McDougall: Electrical Dept. 11 A.M., Mr. Endean: Venereal Diseases. 2 P.M., Dr. Burrell: Chest Cases.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Dowling: Skin Dept. 2 P.M., Mr. Gibb: Eye Dept.

THURSDAY.—11 A.M., Sir Henry Simson: Gynaecological Wards. 12 noon, Surgical Registrar: Surgical Pathology.

FRIDAY.—2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

BUSH, W. H., L.M.S.S.A., L.S.A., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Chulmleigh, Devon.

DONNELLY, N. M., M.B., B.Ch. R.U.I., D.P.H., Assistant Medical Officer and Tuberculosis Officer for Deptford.

MOXON, F., M.B., B.S. Durh., Ophthalmic Surgeon, The Nelson Hospital, Merton.

TURNER, EILEEN M., M.B., B.S. Lond., Assistant Medical Officer of Health and Assistant School Medical Officer, Holland, Lincs.

Manchester Royal Infirmary: **SMIRK, F. H., M.B., Ch.B.,** **MARSHALL, C. T., M.B., Ch.B.,** **YOUNG, N., M.B., Ch.B.,** and **MUCKLOW, S. L., M.B., Ch.B.,** House Physicians; **LANGFORD, C. F., M.B., Ch.B.,** **BOLTON, N. W., M.B., Ch.B.,** **BOOTH, G. H. H., M.B., Ch.B.,** **WOOD, R., M.B., Ch.B.,** and **SEED, N. F., M.B., Ch.B.,** House Surgeons; **PENMAN, H., M.B., Ch.B.,** House Surgeon to Special Department; **MUMFORD, P. B., M.B., Ch.B.,** Assistant in the Dermatological Department; and **JOHNSON, M., M.B., Ch.B.,** Surgical Clinical Assistant.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead Borough Hospital.—Third H.S. £100.

Bristol, Cosham Memorial Hospital, Kingswood.—Res. M.O. £150.

Carlisle, Cumberland Infirmary.—H.P., &c., at rate of £155. Also Jun. H.S. at rate of £135.

Derby, Royal Derby and Derbyshire Nursing and Sanitary Association.—Hon. Obstet. P.

Derbyshire County Council.—Asst. Sch. M.O. and Tub. O. £650.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Liverpool County Borough.—Jun. Asst. Sch. M.O. £600.

Manchester and Salford Hospital for Skin Diseases.—H.S. £100.

Newcastle-upon-Tyne, Princess Mary Maternity Hospital.—Asst. Res. M.O. at rate of £40.

Plymouth Borough.—Asst. M.O.H. £600.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £150.

St. Bartholomew's Hospital.—Ophthalmic S. and Phys.-Accoucheur.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. at rate of £75.

Sudan Government, Wellcome Tropical Research Labs., Khartoum.—Asst. Bacteriologist. £720.

Sunderland Royal Infirmary.—H.P. £140.

Sunderland Royal Infirmary and Children's Hospital.—Hon. S. for Ear, Nose, and Throat.

Warrington Infirmary and Dispensary.—Jun. H.S. £175.

West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. at rate of £150.

West Riding County Council.—Dist. Tub. O. for Barnsley. £600.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment for a Certifying Factory Surgeon at Maesteg (Glam.).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for the Districts of the Aberayron, Cardigan, &c. (Circuit No. 31). Applications should reach the Private Secretary, Home Office, not later than August 22nd.

Births, Marriages, and Deaths.

BIRTHS.

SATOW.—On July 26th, at "Ackland," Oxford, the wife of Lawrence L. Satow, M.C., M.R.C.S., of a son.

MARRIAGES.

HILL—VARLEY.—On July 28th, at the Congregational Church, St. Leonards-on-Sea, Humphrey Cheetham Hill, M.B., B.Ch., to Hilda Frances, fourth daughter of Rev. and Mrs. Henry Varley, of St. Leonards.

LODGE—CRESSWELL.—On July 27th, at the Parish Church of St. Mary the Virgin, Burley-in-Wharfedale, Samuel Durham Lodge, F.R.C.S., to Margaret Ianthe Edgar Alston, eldest daughter of Lionel Cresswell, J.P., Barrister-at-Law, and Mrs. Cresswell, of The Hall, Burley-in-Wharfedale.

POTTS—HEPWORTH.—On July 30th, at Brompton Parish Church, South Kensington, Dr. John Leonard Potts, to Nancy May, younger daughter of Mr. and Mrs. Allan Hepworth, of Ealing.

DEATHS.

BUNNY.—On July 23rd, Joseph Brice Bunny, L.R.C.P., M.R.C.S., of Victoria-park, Weston-super-Mare (formerly of Newbury), aged 78.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

PUBLIC HEALTH IN THE NEW HEBRIDES.

A DECLINING NATIVE POPULATION.

Mr. M. King, C.M.G., British Resident Commissioner, in his report for 1923, remarks that the New Hebrides, to which are attached the Banks and Torres Islands, have an area of about 5700 square miles. The natives are Melanesians, but in places there is a mixture of Polynesian blood. There is little change to be recorded in the numbers and composition of the non-native population of the group, the total of French nationality being 709 and of British 275. In regard to the gradual decrease in the native population, Mr. King thinks that of the many reasons assigned for it, those assigned by the late Dr. W. H. R. Rivers, F.R.S., than whom none was more competent to speak, are the most worthy of consideration. He attributed the decline of the Melanesian population to this: "That the people have been deprived of nearly all that gives interest to their lives, and this loss of interest has been brought about by the unintelligent and indiscriminating action of Europeans towards native institutions." The Resident Commissioner proceeds: "I will not quote further, but would invite attention to the original essay in the work referred to ('Essay on the Depopulation of Melanesia,' Cambridge University Press, 1922). The lack of intelligence displayed by would-be civilisers in their action towards natives and native institutions has often impressed itself upon me. The action of such people appears never to be guided by consideration of the effects, positive or negative, good or ill, of such institutions on the native mind or character. The fact that the natives take interest in, and derive pleasure from, such or such an institution, seems sufficient to ensure its discouragement and ultimate suppression. To many of these institutions the natives have been strongly attached, and the blank in their lives left by their discontinuance or suppression is one that cannot be filled."

In most of the islands of the New Hebrides there is a great disproportion between the numbers of the two sexes, males in all cases predominating. Figures collected not long since by the Rev. M. Frater, of the Presbyterian Mission, relating to the population of two of the larger islands and of seven smaller ones, reveal disproportions ranging 5 to 30 per cent., the aggregate of males being 6508 and of females 5408. The general opinion for long was that this preponderance of males in northern islands is due chiefly to female infanticide, ill-treatment of female infants, the premature marriage of girls, and other preventable causes. Careful inquiry has, however, revealed the fact that, while the influences cited have a powerful effect, there is another and probably the chief one, and that is that the excess, as Mr. Frater writes, "begins at birth and is determined by prenatal causes. The male largely out-number the female births, and through the operation of the other causes the disparity between the sexes becomes more marked in adolescence and adult life." This may also be one of the non-contributory causes of the general decline of the native population. As opposed, however, to the experience of the northern islands, a census of the scanty native population of Efate and the adjacent small islands, also made, and very recently by Mr. Frater, revealed a distinct preponderance of females, but not to the same extent as noticed in the case of the males of the northern islands.

The Mission Hospital on Iririki (John G. Paton Memorial) continued its good work, as did the French Government Hospital in Vila. Unfortunately, the departure of the medical officer in charge necessitated the suspension of active operations by the first named before the end of the year. During the months it was open the number of in-patients was 482 (Europeans 17 and natives 465), and the out-patients numbered 902. At the French institution 870 in-patients were treated (Europeans 154 and natives 716), and out-patients to the number of 1965. The deaths in the British hospital numbered 33, 2 being Europeans, and in the French 42, 3 being Europeans. At the French hospital in the Canal de Segond (Santo) many natives benefited from the care of the Condominium medical officer. The Mission Hospital on the island of Tanna has been reopened and much good work has been done by Dr. Williams, the medical officer in charge. It is to be regretted that the arrangement made by the mission authorities was for a few months only. A complete hospital on the island of Ambrym was destroyed by the great volcanic eruption of 1913. The authorities of the mission fund which supported this institution have, it is learnt, decided to replace the destroyed building by another to be erected on the east coast of the island of Malekula. This project, if carried out, will supply a long-felt want, the destruction of the Ambrym

institution having left the northern part of the group entirely unprovided in this respect. Influenza, fortunately not of the pneumonic type, and dysentery have claimed their usual toll of native victims.

A LIST OF SANATORIA.

THE Ministry of Health has issued a new list, 10(b), dated July, 1925, price 2d., enumerating the sanatoria and other residential institutions approved for the treatment of persons suffering from tuberculosis. This list, which takes the place of an earlier list, 10(a), dated April, 1923, applies to residents in England and Wales, and gives the names of the administrative counties and county boroughs in which the institutions are situated. The list distinguishes institutions where admission is restricted as regards class of disease and sex and gives in each case the date on which ministerial approval expires.

CLITORIDECTOMY IN OLD CALABAR.

In a note on the custom of fattening up the girls of marriageable age among the Efik tribe at Old Calabar, Mr. L. W. G. Malcolm, in the August issue of *Man*, gives some particulars in regard to the operation of clitoridectomy, usually performed by the mother. The fattening-up process takes place at the age of puberty when the girl is secluded for from six months to two years, the period depending on the social position of the parents. The "surgical" operation takes place at or near the end of the girl's period of seclusion. "A piece of coconut shell is shaved very thin and a hole bored through. The glans clitoridis is drawn through this hole and cut off with a sharp knife or splinter of glass. It is believed that the operation has the effect of making the girl sterile. Notwithstanding this the women themselves are the chief supporters of the custom and resent any interference." The note also shows by reproductions of photographs the remarkable effect produced by eating vast quantities of fat-producing foods, including pounded yams cooked in palm oil.

ORGANISED VOLUNTARY CHILD WELFARE.

THE annual report of the Central Council for Infant and Child Welfare for the year ending April 1st, 1925, is a record of steady advance in many directions. In addition to its activities as a centre of information the work of the Central Council included the organisation, in conjunction with the British Red Cross Society, of a day nursery at the British Empire Exhibition at Wembley. This nursery proved a most successful piece of pioneer work, since during the time it was open it cared for no less than 11,091 children.

Another scarcely less important development during the year was the reorganisation and extension of the Travelling Exhibition, which has been in such demand that it was found necessary to collect a duplicate. Bookings were received for every month except April and December when the exhibitions were, for various reasons, not available. The educational value of these exhibitions can hardly be overestimated. In Blackburn 30,000 people visited it during the ten days it was on view, and the attendances at many other places were equally good. A permanent exhibition is now being collected at Carnegie House in response to a widely expressed desire, in which model exhibits of maternal and child welfare work will be on view daily to those interested free of charge. The exhibits included model garments for expectant mothers as well as for infants and children; a dental section, with diagrams showing the effect of diet on the development of the teeth; a clean milk section; a diet section; a rickets section, with exhibit from the Lister Institute of Preventive Medicine; a tuberculosis section; a cripple section; a chamber of horrors; posters, both English and American; an Indian section; and a model of a Red Cross child welfare centre.

A valuable innovation has been the provisional arrangement entered into with the College of Nursing, whereby the Library of Nursing is to be available to borrowers recommended by the Central Council, the Council contributing an annual sum to cover the extra cost of books purchased and the expense of administration. The scheme appears to be working well, and should enable students and infant welfare workers to obtain the best and most up-to-date publications on any branch of public health work.

Brief reports are given of the work of the federations of infant welfare centres throughout the country, as well as of the various constituent societies of the Central Council. In each case the record is one of progress and development.

INDEX TO "THE LANCET," VOL. I., 1925.

THE Index and Title-page to Vol. I., 1925, which was completed with the issue of June 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

SOME

Practical Considerations

IN THE CONSERVATIVE TREATMENT OF FRACTURES OF THE PELVIS AND LOWER EXTREMITY.*

A Course of Four Lectures delivered for the University of London at St. Bartholomew's Hospital

BY SIR WILLIAM I. DE COURCY WHEELER,
M.D. DUB., F.R.C.S. IREL.,

PAST PRESIDENT, ROYAL COLLEGE OF SURGEONS IN IRELAND.

LECTURE I.

IN these lectures I will allude only to the management of cases of fracture of the lower extremity, directing my remarks to those who will have to deal with them under conditions where elaborate apparatus cannot be obtained by a nod, where highly skilled consultants are not always available, and where the results of after-treatment depend largely upon the doctor himself.

FRACTURES OF THE PELVIS.

General Considerations.—When I was a student I was taught by the late Prof. E. H. Bennett—a really great authority on the subject of fractures—that extensive fractures of the pelvis were rare and that recovery seldom followed. Twenty-five years have elapsed. Under modern conditions both statements must be amended. Fractures of the pelvis have increased in frequency with the development of industrial machinery and rapid transport, for the crushing injuries associated with accidents to motor-cars, aeroplanes, and those employed in the modern factory supply us in bulk with this morbid material. Nor is the former gloomy outlook justified to-day, for surgery has not lagged in the race, and injuries contemplated with awe by our predecessors are confronted without misgiving and treated with success by modern methods.

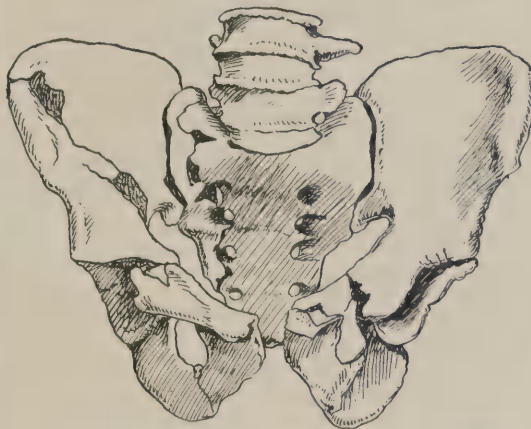
Figures given by older authorities, such as Von Bergmann, Mikulicz, and Bruns, indicate that fractures of the pelvis constitute only 0.3 per cent. of all fractures. From my own experience alone the percentage appears to be greater. To illustrate these lectures I had no difficulty in recalling seven comparatively recent cases, without going through the hospital records. It must not be taken for granted that fractures of the pelvis arise only from severe injuries. Cases have been recorded from a slight fall on the hip, and death has followed in such cases from visceral injury and peritonitis.

In Malgaigne's classical double vertical fracture, the flanges of the ilia are approximated, the anterior portion of the pelvic arch breaks, and posteriorly there is either separation of the sacro-iliac joint or fracture of the ilium vertically downward from the crest to the greater sciatic notch (Fig. 1). The fracture in front is often on one side and the fracture behind on the other. When one side of the pelvis is thus broken away from the rest of the bone it and the attached lower extremity are necessarily connected with the rest of the body only by the soft parts which unite the pelvis to the spinal column and trunk. These soft parts are liable to severe stretching, laceration, and other injuries, which will be mentioned later on. The symphysis pubis or the sacro-iliac joint may be torn asunder, and, in a few cases, separation has occurred both at the symphysis and at the sacro-iliac joint. Separation of all three pelvic joints, not associated with fracture, is an injury the existence of which is doubtful, but I have seen a case with Dr. Gibbon FitzGibbon, Master of the Rotunda, in which there were very wide independent movements of one side of the pelvis upon the other due to laxity

of the ligaments of all three joints, with no history of injury and not connected with pregnancy.

Of the isolated fractures of the pelvic bones which do not break the continuity of the pelvic ring, fracture of the acetabulum is the most interesting. I have in Mercer's Hospital at the moment a case of dorsal dislocation of the hip which, owing to a fracture of the posterior rim, slipped out of place after several reductions. The reduction was subsequently made by direct extension and swinging movements and maintained in position by fixed extension in a

FIG. 1.



Comminuted fracture of the pelvis. (Spencer and Gask.)

Thomas splint. This is one of the two common types of fractured acetabulum. The second type is illustrated in the case of a man admitted into Mercer's Hospital in 1909 after a severe injury to the hip. An impacted fracture was diagnosed, but X ray photographs showed the head of the femur driven through the acetabulum into the pelvis.

In the first group of cases the fracture of the rim is associated with backward dislocation of the femur, and the symptoms are those of dorsal dislocation with difficulty in maintaining reduction. In the second group the head is forced into the acetabulum, causing fracture; sometimes the head passes through the fracture into the pelvis, sometimes not. The diagnosis is, in consequence, sometimes easy and sometimes difficult. In the more severe type the trochanter is less prominent than normal, the shortening is slight or absent; there is, of course, severe pain, and motion is restricted in every direction.

In differentiating between fracture of the acetabulum and fracture in the region of the neck of the femur, it will be remembered that in fractures of the neck from severe violence the limb lies extended and usually rotated outwards, and that impaction comminutes and makes the trochanter prominent. In fractures of the acetabulum with penetration of the head of the femur, the trochanter is much less prominent, but the difference may not be sufficient to make a diagnosis. In both conditions there is usually absolute loss of function. In most cases help may be obtained by making a rectal examination, but most surgeons will reserve judgment until an X ray photograph has been obtained.

In the one case of central dislocation through the acetabulum into the pelvis which I have seen reduction was impossible, but a fairly good functional result followed. The man, on leaving hospital, was able to continue his occupation as a hackney car driver.

Amongst the seven cases to which I have referred is one of isolated fracture of the sacrum and fracture of the coccyx in a child of 12. She fell from a swing on her sacral region. The interest in this particular case was the absence of symptoms except for some local pain. The patient was brought in casually for examination three weeks after the injury. An X ray

* All the cases referred to were illustrated by lantern slides.
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photograph showed a transverse fracture of the sacrum between the third and fourth segments without displacement. She was seen four years later and had no pain or trouble of any kind.

When displacement of the fragments occurs the injury is extremely painful and some of the sacral nerves are likely to be involved. There may be also interference with defaecation and urination in some cases due directly to the displacement of the fragments, in other cases to paralysis following injury to the sacral nerves. The displacement of the fragments can be felt per rectum, and under an anæsthetic the alignment can sometimes be restored. Fractures of the sacrum alone are very rare.

Fractures of the coccyx, owing to the mobility of the bones, are also extremely rare, and are of importance owing to the probability of subsequent coccydynia, necessitating removal of the bone. Fractures of the ilium are not uncommon. They involve the upper expanded portion, including the crest, and cases are reported in which the anterior superior, and inferior and posterior spines have been torn away by muscular action. With the body bent forward and the thighs flexed upon the pelvis, there is sufficient muscular relaxation to detect a fracture, and a good X ray picture can be obtained by placing the injured side upon the plate and passing the rays obliquely from before backwards. In treating these fractures care must be taken not to press the fractured portion of the ilium unduly inwards.

Isolated fractures of the ischium are extremely rare. Many standard authorities are silent upon this subject. Bennett¹ described a case in which the ischium was detached from the left innominate bone by fracture with displacement backwards and upwards. The great sciatic notch in this case was reduced to a mere slit, and the displaced bone was united to the side of the sacrum. The head of the femur participated in the displacement.

Treatment.

The treatment of fractured pelvis resolves itself into treatment of the injured soft parts and of the fractured bones.

INJURY TO THE URETHRA, BLADDER, AND SOFT TISSUES.

The urethra and bladder are the organs which suffer most frequently and, as compared with these, injuries to other parts are of little practical importance. The rectum and vagina may be injured, or the large veins of the pelvis may be torn—an accident rapidly followed by death. In a case recorded by Bell and Fischer a diffuse traumatic aneurysm of the gluteal artery developed after fracture of the pelvis. Bryant reported three cases in which thrombosis of the external iliac artery followed a fracture of the pelvis. This was due to over-stretching of the artery by the displaced fragments. The internal and middle coats had been torn, the external coat remained intact. In one of these cases gangrene of the leg developed.

Large extravasations of blood after injury to the pelvis may undergo suppuration. The sciatic and obturator nerve may be crushed, with subsequent prolonged and intractable neuralgia. It is, however, the complication of rupture of the bladder and rupture of the urethra, or of both, which is of most practical importance and requires urgent attention. If such complications are recognised without delay and treated along rational lines, the immediate and ultimate results are not at all so depressing as many would have us believe.

Rupture of the Bladder.

Rupture of the bladder may follow injury apart altogether from fractures of the pelvis, or the rupture may be associated with fracture of the pelvis without being actually produced by the broken bones. The site of the lesion may be either above or below the peritoneal reflection. If below, the tear is on the

anterior surface, either in an accessible position or out of reach low down in the neighbourhood of the trigone. If the rupture is intra-peritoneal, it is placed more often on the fundus of the bladder or posteriorly. According to the position, the urine either escapes into the space of Retzius and percolates towards the anterior abdominal wall, or it is freely extravasated into the peritoneal cavity.

In the surgical works of Spencer and Gask, to which I am indebted for much information on the subjects under review, it is stated that wherever stale urine spreads it produces inflammation and sloughing. This statement applies, however, as is made clear in the text, to the more familiar types of extravasation following the ulceration and rupture of the urethra behind an old-standing stricture. The urine under such circumstances is foul and infected. On the other hand, the onset of peritonitis, cellulitis, and suppuration, with accompanying rigors, rise of temperature, and general symptoms of toxæmia, may be delayed for a period of even two or three days in cases of leakage from the urinary bladder containing healthy urine.

I recollect a case which occurred in a casualty clearing station in France, in August, 1916. The patient had fallen from the roof of a house, fractured his jaw and both forearms, and, so far as it was possible to ascertain, had sustained some fracture in the region of the pubes. He had abdominal tenderness, and made ineffectual attempts to pass water. Ruptured bladder was diagnosed, but on passing a catheter a full quantity of urine was withdrawn and it contained blood. The amount withdrawn appeared to us to justify delay. The abdomen became more rigid in a few hours, but his pulse remained between 80 and 90, and there was no vomiting nor rise of temperature. The inability to urinate continued, and a catheter was passed every four hours. Blood was present only on the first occasion, and urine was withdrawn at every catheterisation in moderate quantity. The patient's aspect became gradually worse. Rigidity was more marked, vomiting had commenced, and early signs of peritonitis became evident.

When I operated upon this patient 24 hours after admission a large rent was found on the fundus of the bladder, and the abdomen was full of urine without odour. The rent was stitched and the abdomen closed without drainage. A catheter was passed while the abdomen was still open, and it became obvious that on each occasion the catheter had gone through the rent in the bladder and the urine had been drawn from the peritoneal cavity. The first diagnosis on admission had been correct, but the result of catheterisation was so confusing that there was uncertainty and delay. Notwithstanding the multiple injuries and the lapse of 24 hours before operation, the patient did well.

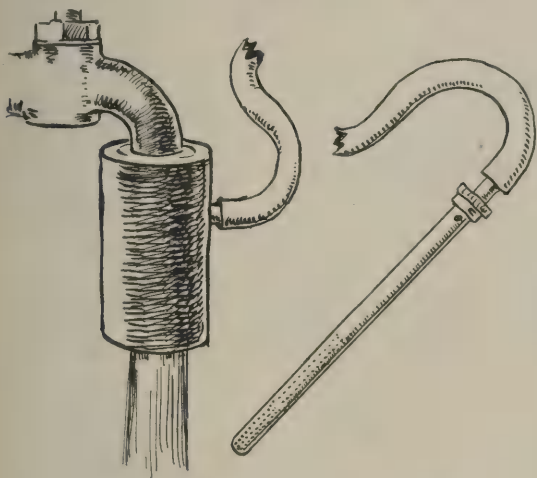
The diagnosis of ruptured bladder is not as a rule difficult. There is always a strong but ineffectual desire to urinate. A catheter passes freely through the urethra, but only small quantities of blood-stained urine return. To make a diagnosis, some authorities suggest that a measured quantity of fluid should be injected and the quantity returned carefully noted and checked. The disadvantages of such a procedure are obvious. If the injected fluid leaks through a rupture into the peritoneal cavity the desired information is obtained, but the shock from which the patient suffers becomes more pronounced. If it returns in full quantity it may have passed through an extra-peritoneal rupture into the space of Retzius and return without appreciable diminution of quantity. Under such circumstances the surgeon is misled.

With an inability to void urine, associated with the free passage of a catheter and the return of only small quantities mixed with fresh blood, the case is one for immediate operation. The differential diagnosis between intra- and extra-peritoneal rupture is difficult in the presence of shock, tenderness, and rigidity, but the treatment is the same. Some suggest that the first exploration should be above the pubes, below the peritoneal reflection, but I agree with Keyes, who recommends the peritoneum to be opened in the first instance. The intra-peritoneal rupture is more common, and, furthermore, in dealing with extra-peritoneal injury in the presence of blood and extravasated urine and an empty bladder, sufficient room can scarcely be obtained by the usual extra-peritoneal suprapubic route.

¹ Trans. R.A.M. in Ireland, 1887.

If the abdominal cavity is found to contain urine and blood, it is syphoned off through the simple aspirator (Fig. 2) now used largely for the withdrawal of accumulations of fluid of any origin, and the rent in the bladder is closed and covered, if possible, by a piece of omentum. A small corrugated rubber drain is passed to the line of suture. A self-retaining rubber catheter is introduced per urethram.

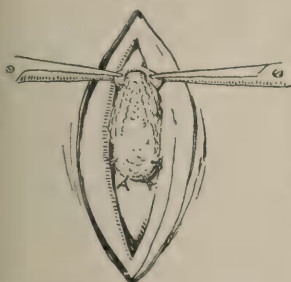
FIG. 2.



Aspirating pump attached to water tap.

In some of the earlier cases described by Walsham death followed operation owing to leakage at the point of suture, and on this account some recommend that fluid should be injected through the urethra to make sure of a water-tight closure while the abdomen is still open. I think such a procedure adds to the time and leads to confusion during operation, and that the use of a self-retaining catheter is a sufficient safeguard. If, on the other hand, it is found that the rupture is not into the peritoneum, the abdominal contents are packed away, and the injury usually will be found on the anterior surface of the bare area of the bladder and should be sutured in the ordinary way. A tongue-shaped portion of omentum (Fig. 3)

FIG. 3.



Opening in bladder covered by omentum.

a horse rearing and falling backwards on the rider, in which the urethra was ruptured. They illustrate the difficulties of treatment under one set of circumstances and the satisfactory outcome and ease of operation when conditions are favourable.

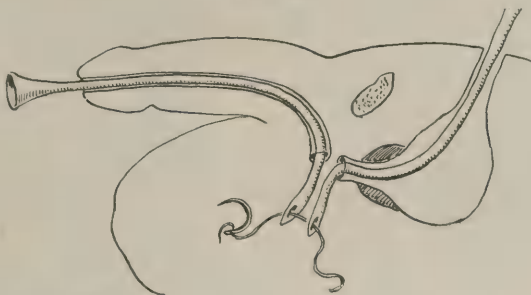
In the first case the patient, aged about 28, was injured in the manner indicated early in September, 1921. He was seen late at night in the country, after an accident in the early morning. He had been making intense but ineffectual efforts to pass water, and there was consequent extravasation. It was impossible to pass a catheter beyond the region of the triangular ligament. Urine and blood were penetrating

into the perineum, scrotum, and from the space of Retzius forwards towards the anterior abdominal wall. Both layers of the triangular ligament were apparently torn.

The operation was of the emergency variety. The bladder was opened above the pubis and drained, and free incisions were made into the infiltrated tissues of the perineum. After ten days the patient was brought to Dublin, and an X ray photograph showed a double vertical fracture involving both rami of the pubes on one side and the region of the sacro-iliac joint on the other. The acetabulum was involved, a complication which subsequently led to bony ankylosis of the hip. Eleven days after the accident, in the presence of many drainage incisions, a successful attempt at secondary suture of the urethra was performed by a colleague, who kindly took charge of the patient during my unavoidable absence from Dublin.

An operation after such a lapse of time and in the presence of infection is often very difficult and unsatis-

FIG. 4.



Catheters passed and made to point in perineum. (The instrument passed in retrograde fashion should be metal.)

factory, and is followed usually by traumatic stricture. The hip-joint, which was involved by the fracture and open to infection, was exquisitely painful, a condition which added considerably to our difficulties. Extension and abduction were employed until the patient was discharged from hospital five months after admission.

I found it necessary to pass sounds frequently, generally under an anæsthetic, for nearly two years. Four weeks ago I received the following letter from this patient. He had failed to report regularly for over a year: "Sounds were last passed on me on Oct. 8th, 1923 (two years after the injury), and the last abscess was opened in November, 1923. Since then I have had nothing done, and have been very well indeed. I cannot yet manage to ride, but find every time I try I can manage better. There is a great strain

FIG. 5.



Urethra sutured with catheter as a guide. Note the thread coming through suprapubic wound.

when my legs are across a horse. I play a fair amount of golf and dance a bit, and I have great hopes of riding again some day." From this letter it would appear that the ankylosed hip is the main disability. It is a satisfactory report three and a half years after so serious an injury.

I am indebted to Dr. J. V. O'Hagan for the later history of this case.

The second case arrived in hospital a few hours after his accident, and illustrates the happy results which follow when surgical interference is early and when ideal treatment is possible.

A young officer fell with his horse on top of him while hunting. The pubes appeared to be pulled apart, and X rays showed a stellate fracture along one margin of the joint. Again, there were all the signs of urethral rupture—a great but ineffectual desire to urinate, a desire which his medical practitioner in the first instance wisely warned him to curb. Efforts to pass a catheter completely failed.

The line of treatment adopted is the line I would recommend in cases seen early. Instead of opening up the perineum through infiltrated and bruised tissues in search of the proximal end of the urethra, it is best, I think, to open the bladder in the first instance, and to pass a catheter in retrograde fashion down through the proximal portion of the tear. An assistant holds this instrument while the end of it is exposed through a perineal incision. A rubber catheter is now passed through the penile portion, and the eye is attached by a silk thread to the instrument passing from the bladder. The bladder instrument is withdrawn, pulling with it the rubber catheter, the eye of which now appears through the suprapubic wound. The urethra is then accurately sutured end to end with the rubber catheter as a guide (Figs. 4 and 5). A good headlight is essential for accurate work. The perineal wound is cleansed, preferably with some of the chlorine preparations (such as "Fecto") or treated with bipp. It is then sutured closely, a small superficial rubber drain being left in situ. A long thread is attached to the point of the catheter coming through the suprapubic opening before it is gently manoeuvred into the

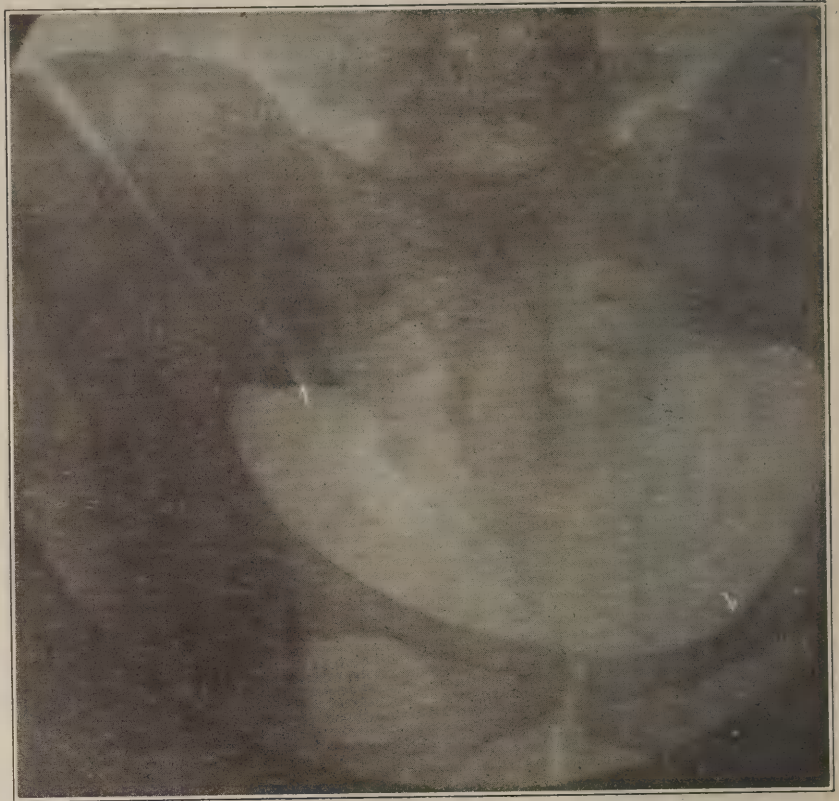
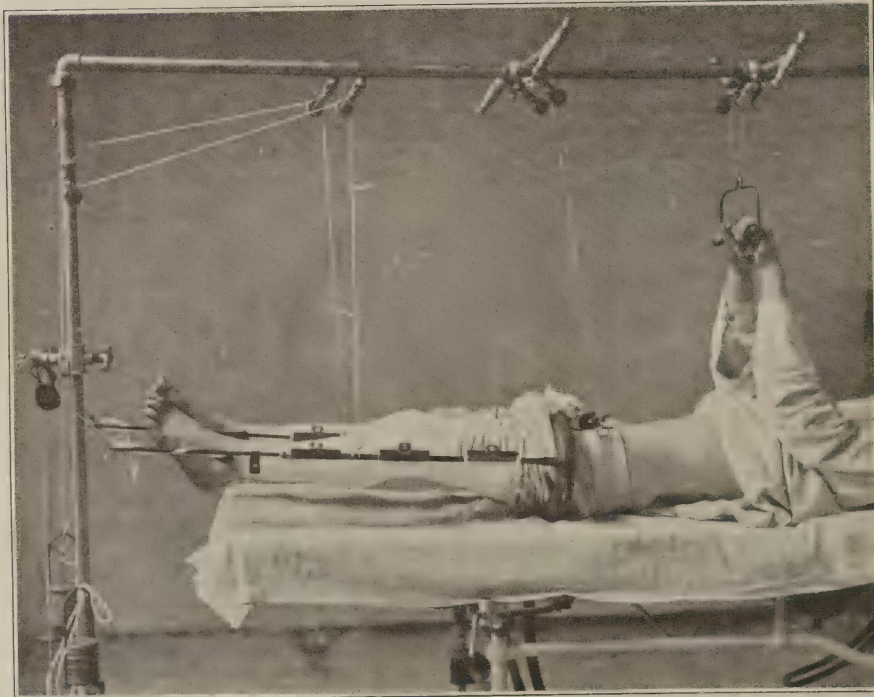


FIG. 6.
Double vertical fracture in which there were no indications of bony injury before radiograph was taken.

FIG. 7.



Convenient arrangement for treatment of pelvic fractures.

bladder by a pull on the penile end; this thread may be conveniently tied to one of the skin sutures. The bladder is drained by a small suprapubic tube. At the end of four or five days a fresh catheter is attached by a stitch to the meatal end of the one already in position, and by pulling on the suprapubic thread the new catheter takes the place of the old. This process can be repeated for a fortnight when a catheter is passed in the ordinary manner and the suprapubic wound allowed to close.

The patient so treated was admitted to hospital in January, 1924. He was up and about at the end of five weeks, and left hospital six weeks and two days after admission. On a few occasions afterwards an instrument was passed without difficulty, and he rejoined his regiment apparently well.

FRACTURE OF THE PELVIS WITHOUT DISTINCTIVE SIGNS AND NO COMPLICATIONS.

The third illustrative case shows a double vertical fracture in a lady who was unfortunate enough to be in a motor-car when it overturned, and who had apparently no injury to the soft parts beyond bruising and ecchymosis. At the first

examination she stated she felt bruised and sore, and had some pain in her back. Movements of her knees and hip-joints did not cause pain; no shortening could be found. The crests of the ilia were in normal position; pressing them inwards caused no special pain. Rectal examination revealed nothing, and I came to the erroneous conclusion, in agreement with the local doctor, that there was no gross bony injury. An X ray examination was made as part of the routine examination, and a fracture was found on the left side, splitting the ilium from the lower angle of the sacro-iliac joint to about the middle of the crest (Fig. 6). The pubic arch on the right side was broken above and below the obturator foramen. The patient was kept in bed for six weeks, and after two months was able to move about apparently well. This lady wrote to me a few weeks ago as follows: "I am glad to say I feel absolutely no ill-effects in any way. I am not the slightest bit lame, and can dance all night; I have danced four nights this week into the early hours of the morning. I had not ridden for eight years, and rode for the first time recently, and went for a short gallop about a mile, and never felt anything. In fact, I can do anything I ever did before."

With regard to the treatment of fractured pelvis apart from complications. When a double vertical fracture exists, or when the bones are much comminuted, some effort must be made (1) to reduce displacements, (2) to give stability to the fragments, and (3) to assist nursing.

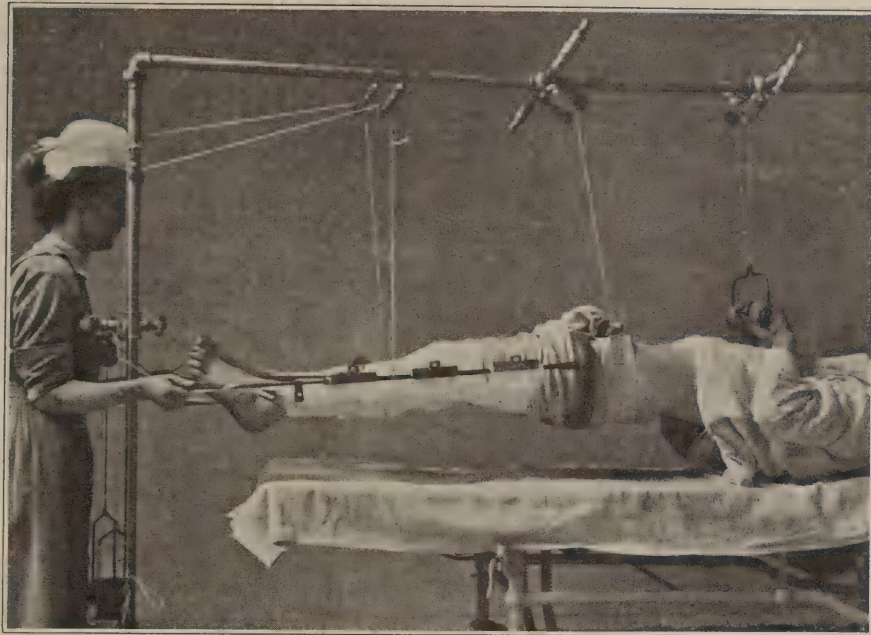
The muscles attached to the broken bones can be relaxed to some extent by flexing the leg at the hip and at the knee (Fig. 7). Both legs should be slung in Thomas splints in this position. (The splints in the illustrations should be shown bent at the knee.) A girth or strong bandage is strapped tightly round the pelvis between the trochanter and the ilium. Strong cords are attached to a ring on each side of the girth (Fig. 8) and passed over pulleys towards the head of the bed, where they are connected to a handle which the patient grasps when changing position. The raising of the pelvis for nursing purposes is thus rendered easy. If one side is displaced upwards, extension is applied to the corresponding leg by weight and pulley. As an alternative the double Thomas frame, as recommended by Jones, leaves little to be desired.

Isolated fractures of the pelvis must be treated intelligently. In the case of fracture of the posterior rim of the acetabulum, the dislocated hip, as already stated, can be easily reduced by direct extension with the patient lying on the floor under an anæsthetic. Extension can be maintained, and recurrence of the dislocation prevented, by the application of a Thomas splint with fixed extension. Cases have been described where a central dislocation of the hip with fracture of the acetabulum have been successfully reduced and treated. No routine manipulation can be described. Ordinary traction in the long axis of the limb and slight abduction may succeed. Lateral traction is indicated, but if the head has perforated the pelvis it will be necessary forcibly to disengage

it from the encircling acetabulum before lateral traction will become effective.

In the rare case of fractured ischium, which involves the acetabulum and in which the head of the bone is

FIG 8.



Patient raised by his own aid for nursing purposes.

drawn towards the sacrum, obliterating the sciatic notch, heavy weight and pulley extension seems the obvious remedy.

SOME OBSERVATIONS ON THE DOSAGE OF ULTRA-VIOLET RAYS IN ARTIFICIAL SUN TREATMENT.

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THE general method adopted in the treatment of disease by means of heliotherapy or "artificial sunlight" consists of the gradual exposure of the body to a source of light emitting ultra-violet rays. Dr. Leonard Hill has shown, by means of the acetone methylene-blue light gauge, that there is a great variation in the intensity of ultra-violet rays at different times of the day and at different parts of the country. Many kinds of "artificial sun lamps" are being used in various clinics where light treatment has been adopted, all of which vary considerably in their electrical energy and in the ultra-violet energy they radiate. These facts show that it is very difficult to compare or contrast the results obtained at the various clinics, for if patients are exposed to light for a definite period of time the actual quantity of the ultra-violet energy they receive must vary enormously.

The original work of Widmark¹ showed that the ultra-violet rays produced a biological action in the skin. Finsen, Freund, and Hamer carried this research further, and have conclusively proved that the ultra-violet rays which have the power of producing sunburn possess very great therapeutic value. In

¹ Scand. Arch. f. Phys., 1889, i., 264.

the practical application of light no isolated portion of the ultra-violet spectrum can be usefully employed, as there are no means available at present to produce individual bands of the ultra-violet spectrum of sufficient intensity.

Dosage of Ultra-violet Light Sources.

As a result the whole range of the spectrum, including heat, luminous, long and short ultra-violet rays, is employed, and the mass effect of the rays must be considered. Up to the present very little attention has been given to the question of dosage of ultra-violet light sources, and many workers consider this superfluous. The individual variations

in sensibility to light make it impossible to fix a standard dose, even with a standard source of light. From this point of view it is indeed very difficult to determine the most suitable method for administration of light treatment, and further to decide if any harmful effects can take place from excessive dosage with light. Two important facts must be con-

sidered before accurate dosage with light can be established: (1) The quantity of ultra-violet rays which have biological action, emitted from a source of light; (2) the reaction of the skin to standardised doses of light.

According to the investigations of Hausser and Vahle,² the ultra-violet rays of about 3130-2530 λ have the power of producing erythema of the skin. They exposed small areas of the skin of the arm to isolated ultra-violet rays by means of a large quartz spectroscop. The energy of the rays used was taken of equal value as tested by means of a sensitive thermo-electric couple. These investigators gave the following scale of skin sensibility estimated in relation to the degree of erythema produced:—

Wave length in λ .	Sensibility. Per cent.	Wave length in λ .	Sensibility. Per cent.
3130	4.5	2800	28
3020	58	2650	19
2970	100	2530	16
2890	30		

Rays shorter than 2530 λ also produced a faint erythema.

H. v. Schrotter³ has shown that light from 3600 λ was effective in producing erythema; Leopold Freund⁴ claimed that light from 3900 λ was effective; but these observations cannot be confirmed. Therefore, according to Hausser and Vahle's investigations, 69 per cent. of light erythema is caused by 3020-2970 λ . Johansen⁵ placed this percentage as 72. Dr. L. Hill has shown that when the skin of the forearm is exposed to light through a quinine filter (which cuts out all rays shorter than 3300 λ) no erythema developed after one hour's exposure. Further, he exposed his arm to the cadmium spark through a quartz spectroscop, and definitely showed that the rays 2750 and 2570 produced erythema, while 2320 and rays shorter than this failed to do so.

² Strahlentherapie, 1923, xiii.

³ Ibid., 1920, xi., 634.

⁴ W. Klin. Woch., 1912, No. 5.

⁵ Strahlentherapie, 1915, vi.

These facts clearly demonstrate that dosage of the ultra-violet must be primarily focused on the intensity of the wave-lengths about 3000-2500 λ , since this group of rays correspond to the rays which have biological action on the skin and on the therapeutic value.

Up to the present moment four methods of dosage have been recorded: (1) Bering-Meyer's⁶ iodine method is based on the separation of free iodine from an acidified potassium iodide solution by means of light. Hackradt⁷ determined the iodine colorimetrically with the Authenthith Konisberger colorimeter. (2) The Eder-Hecht Graukeil photometer was introduced by Freund,⁷ and is based on the sensi-

tiveness of silver photographic paper through a graded gelatin wedge. (3) Fürstineau's⁸ aktinometer is based on the changes in the electrical conductivity of selenium on exposure to light. (4) P. Keller's⁹ modification of the Bering-Meyer's iodine solution. He added starch and varying quantities of sodium thiosulphate to the potassium iodide solution

and obtained a blue colour on irradiation. He has biologically standardised this solution against skin erythema.

All these methods, except that of P. Keller, do not bear any definite biological relation to skin erythema. All of them give reaction with the luminous and long ultra-violet rays, and are not specific in their reactions to the erythema-producing rays—shorter than 3000 λ .

The methods of dosage of light which have been adopted in the present research consist of: (1) Biological standardisation of sources of light; (2) test of sensitiveness of the skin to light; (3) the effect of a test dose of light on the bactericidal powers of the blood.

The Method Employed in Biological Standardisation of Sources of Ultra-violet Light.

Dr. L. Hill and the writer have shown that when infusoria are placed in a shallow water-cooled quartz cell and exposed to a source of ultra-violet rays they lose their motility and are finally killed. The time taken to produce this action depends upon (1) the distance from the source of light, and this corresponds to the law of inverse squares; (2) the temperature¹⁰; (3) the intensity of ultra-violet rays shorter than 3000 λ present in the source of light.

The bleaching of a standard solution of acetone methylene-blue corresponds to the action of light on infusoria, but proceeds at a slower rate. The time required to bleach a standard blue solution No. 9 of acetone methylene-blue to No. 8 corresponds to two to three times the time required to kill infusoria under similar conditions on exposure to the mercury-vapour lamp and four to five times that required on exposure to the carbon arc. Recently T. A. Webster prepared a rapid solution of acetone methylene-blue (No. 4), which was completely bleached in the same corresponding time to that taken to kill infusoria. Unfortunately, this solution is of an unstable

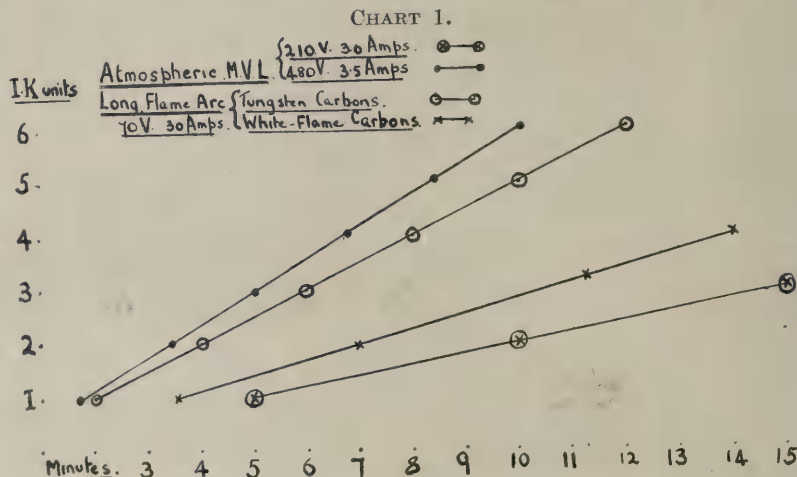
⁶ Ibid., 1912, i.

⁷ Ibid., 1920, x.

⁸ Ibid., 1921, xii.; D. med. W., 1920, No. 49.

⁹ Strahlentherapie, 1923, xvi., 52.

¹⁰ The biological action is accelerated with a rise in temperature within the biological mean of life of the organisms (5°-30° C.).



character. The time taken to bleach a standard solution of acetone methylene-blue and the time taken to kill infusoria, at a temperature of 18°-20° C. and at a distance of 30 inches—i.e., the distance at which patients are usually exposed to light—gives a very satisfactory index to the quantity of ultra-violet rays which have biological action present in a source of light.

If an area of skin is exposed to source of ultra-violet light erythema is produced after a latent period of four to six hours at the site of irradiation. The intensity of erythema corresponds to (1) the distance from the source of light—corresponding to the law of inverse squares; (2) the temperature—the action of the ultra-violet rays is accelerated by temperature; (3) the intensity of ultra-violet rays emitted from the source of light; (4) the susceptibility of the skin to light.

As a general working rule Dr. L. Hill and the writer have shown that an exposure of the normal white skin to a source of ultra-violet light, corresponding to twice the time required to kill infusoria under similar conditions, gives rise to a mild erythema. In this way the reaction of infusoria to light, the reaction of acetone methylene-blue solution, and the erythema of the skin after radiation have been standardised. All sources of light can therefore be standardised by means of these biological, chemical, and skin reactions, and the tests have a relation to each other.

The dose of light can also be expressed in terms of the time required to kill infusoria, each I.K. unit corresponding to the time required to kill infusoria, under the conditions in which the skin is irradiated. Table I. shows the I.K. values for (1) the long flame arc—30 amps. + 75 volts with white flame carbons; (2) the long flame arc 30 amps. + 75 volts with tungsten carbons; (3) the atmospheric mercury-vapour lamp 200 volts + 3.2 amps. (K.B.B.); (4) the atmospheric mercury-vapour lamp (M.V.L.) 480 volts + 3.5 amps. (See Chart 1.)

TABLE I.

—	Volt- age.	Amp.	Time taken to kill infusoria 30 in. distant.	Time taken to give faint erythema of skin.	I.K. units.
M.V.L.	480	3.5	1½ min.	3½ min.	2

TABLE IA.

Lamp.	Volt- age.	Amp.	Time taken to kill infusoria 30 in. distant.	Time taken to produce faint erythema (= 1-1.5 red)	I.K. units.
M.V.L. atmo- spheric K.B.B.	480	3.5	1½ min.	3½ min.	2
Long flame arc, white flame carbons	210	3.2	5 "	10 "	2
Long flame arc, tungsten carbons	75	30	3½ "	7 "	2
Long flame arc, tungsten carbons	70	30	2 "	4 "	2

Individual Sensitiveness of the Skin to Light.

When three small circular areas of skin, about half an inch in diameter, are exposed to light for three periods of time corresponding to 2, 3, and 4, infusoria killing units on erythema varying in intensity is developed at each area exposed. Individuals vary in their sensibility to these standard doses of light, and besides this, the skin of different parts of the body varies in its sensitiveness to light. As a general routine the abdominal skin one inch above the umbilicus was selected for testing the sensitiveness to light.

A black silk band was attached to the abdomen by means of pieces of tape. This band had three circular diaphragms, about half an inch in diameter, cut out at two inches distance from each other, and had a black silk flap attached, so that each area could be easily covered up. The abdominal skin was exposed over these small areas to the source of light for periods

of time corresponding to 2, 3, and 4 I.K. units. The following day two or three circular areas of erythema could be observed at the site of irradiation. The degree of erythema produced was estimated by means of the Lovibond skin colorimeter. Of all

TABLE II.

—	Colour of normal skin. R.=red. Y.=yellow.	2 I.K.	3 I.K.	4 I.K.
		Erythema which developed after exposure to M.V.L. at 30 in.—		
		3½ min.	5 min.	7 min.
Tuberculous glands.	1.1 R. 1.0 Y.	2.3 1.0	3.0 1.0	3.5 + 1.0
Sinusitis.	1.2 R. 1.4 Y.	1.2 1.4	1.6 1.4	2.1 1.4
Lupus erythematosus.	2.0 R. 1.2 Y.	2.5 1.2	3.0 1.2	4.0 1.2
Asthma and eczema.	1.0 R. 1.0 Y.	1.0 1.0	1.4 1.0	1.9 1.0
Rheumatoid arthritis.	1.0 R. 1.0 Y.	1.4 1.0	1.8 1.0	2.0 1.0
Tuberculous ankle.	1.4 R. 1.3 Y.	1.6 1.3	2.4 1.3	3.5 1.3
Anæmia.	2.0 R. 1.1 Y.	2.5 1.1	2.8 1.1	3.1 1.1
Lupus erythematosus.	1.5 R. 1.0 Y.	2.0 1.0	3.5 1.0	4.5 1.0
Dermatitis herpetiformis.	1.1 R. 1.0 Y.	1.1 1.0	1.5 1.0	2.0 1.0
Chronic bronchitis and asthma.	1.6 R. 1.0 Y.	1.6 1.0	2.1 1.0	3.4 1.0
Osteomyelitis of rib.	1.2 R. 1.0 Y.	1.8 1.0	2.1 1.0	3.1 1.0
Scleroderma.	1.2 R. 1.2 Y.	1.2 1.2	1.6 1.2	2.5 1.2
Lupus erythematosus.	1.4 R. 1.0 Y.	1.4 1.0	1.6 1.0	2.5 1.0
Anæmia.	1.0 R. 1.1 Y.	1.0 1.1	1.6 1.1	3.5 1.1
Phthisis.	1.2 R. 1.0 Y.	2.0 1.0	2.5 1.0	3.0 1.0
Goitre.	1.1 R. 1.2 Y.	1.5 1.2	2.0 1.2	3.0 1.2
Colitis.	1.2 R. 1.2 Y.	1.4 1.2	2.0 1.2	2.5 1.2
Sinusitis.	1.0 R. 1.2 Y.	2.5 1.2	3.0 1.2	4.0 1.2
Colitis.	1.0 R. 1.0 Y.	1.3 1.0	2.0 1.0	2.4 1.0
Myocarditis.	1.2 R. 1.1 Y.	1.2 1.1	2.5 1.1	3.5 1.1
Lupus erythematosus.	1.2 R. 1.2 Y.	1.6 1.2	2.4 1.2	3.0 1.2
Pruritus ani.	1.3 R. 1.0 Y.	1.7 1.0	2.0 1.0	3.0 1.0
Rheumatoid arthritis.	0.9 R. 1.1 Y.	1.0 1.1	1.4 1.1	1.6 1.1
Tuberculous knee.	1.0 R. 1.0 Y.	1.0 1.0	1.5 1.0	2.5 1.0
Sinusitis.	1.4 R. 1.1 Y.	1.4 1.1	1.8 1.1	3.1 1.1

the patients tested in this way most gave a reaction with doses corresponding to 3-4 I.K. units, and the degree of reaction was taken as an index of the general individual sensitiveness to light. The colour of a normal white skin usually corresponds to the red No. 1 and yellow 1.0 of the tintometer scale; the exposure to light for 2, 3, and 4 I.K. units gave a very faint erythema with the 2 I.K. dose which disappears rapidly; sometimes it is not visible after 24 hours. The 3 I.K. dose gave an erythema which

was marked and persisted for two to four days. The 4 I.K. dose invariably gave rise to an erythema which was followed by desquamation and pigmentation.

The Lovibond tintometer is a very arbitrary method of estimating the colour of the skin and in many ways it is tedious. Much depends upon the individual selection in comparing colours, and the illumination of the skin plays an important part. It is anticipated that a better and more accurate method of controlling reactions of the skin will be adopted shortly.

The reaction of the skin and the power to produce erythema and pigmentation does not follow the usual routine in infants up to the age of 3 years. The reaction to light in these cases appears to differ from the adult skin. In comparing the erythema produced by varying doses of light, the degree of redness with each dose is obvious and gives a ready means of estimating the sensitiveness of the skin and the reaction to the source of light (Table II.).

Effect of a Minimal Erythema Dose of Light on the Bactericidal Power of the Blood.

Dr. Leonard Colebrook,¹¹ Dr. L. Hill, and the writer have demonstrated that exposure of the human skin or that of animals (rabbits and pigs) to a source of ultra-violet rays produced an increase in the hæmobactericidal power of the blood. It is therefore possible to observe the effects of radiation of the skin by estimation of the bactericidal power of the blood. Following the results obtained from these observations on the effect of the test doses of light on the abdominal skin, the dose of light most suitable for production of an increase in the bactericidal properties of the blood can be determined. In most of these investigations the dose of light selected was that which gave rise to a mild erythema which persisted for one to two days and then disappeared. This dose usually corresponded to 3 I.K. units. The chest and back exposed to the dose of light selected, after carrying out the test dosage of the abdominal skin, usually showed a very faint erythema of the chest—a mild erythema of the back and a definite line of demarcation at the level of the iliac crest, at the zone between the normal and irradiated skin.

General Plan of Procedure.—Three small areas of the abdominal skin were exposed to the mercury-vapour lamp (480 volts and 3.5 amps.) for 3½, 5, and 7½ minutes respectively, at a distance of 30 inches. This corresponded to 2, 3, and 4 I.K. units. The following day these small areas of erythema of different intensity were observed at the sites of irradiation. By means of the Lovibond skin colorimeter the degree of erythema was estimated for each dose of light and was gauged in the manner shown in Table III.

TABLE III.

Colour of normal skin.				2 I.K.	3 I.K.	4 I.K.
				Erythema which developed after exposure—		
				3½ min.	5 min.	7 min.
Red	1.1			2.3	3.0	3.5 +
Yellow	1.0			1.0	1.0	1.0

All these areas irradiated show a definite erythema, although the 2 I.K. dose was faint. The dose of light selected for the bactericidal test was four minutes—i.e., between 2–3 I.K. units. From a series of investigations it has been found that patients who respond fully to all three doses of light, especially the 2 I.K. dose, are very sensitive to radiation. A sample of blood was taken by means of venepuncture and was placed in a sterile test-tube and defibrinated. The back and chest (to the level of the iliac crest) were exposed to two mercury-vapour lamps each 30 inches

in front and behind the patient for four minutes. This corresponds to 2½ + 2½ I.K. units = 5 I.K. units. Two and a half hours after radiation a second blood sample was collected and defibrinated in the same way. The bactericidal power of the blood was estimated by means of slide cells, by the method described by Sir A. E. Wright, L. Colebrook, and E. J. Storer.¹² The next day results were recorded as given in Table IV.

TABLE IV.

Dilution.	W/6.	W/18.	W/36.	W/60.
Number of colonies of staphylococci which grew in each 50 c.cm. of blood before radiation at 2 P.M.	∞	74 ?	42	22
Number of colonies of staphylococci which grew in each 50 c.cm. of blood 2½ hours after radiation at 4.30 P.M. ..	0	0	0	0
Number of colonies of staphylococci which grew implanted with each 50 c.cm. of blood ..	1400	466	233	140

	Percent.
Average hæmobactericidal power of blood at 2 P.M. (before radiation)	= 83
Average hæmobactericidal power of blood at 4.30 P.M. (2½ hours after radiation)	= 100
Increase in killing power of blood (2½ hours after radiation)	= 17

From a series of investigations of 125 cases on the effect of radiation on the bactericidal power of the blood, it has been shown that a mild erythema of the skin after radiation is usually associated with an increased bactericidal power. The normal bactericidal power of human blood against the staphylococcus is usually high, and similar results have been experienced when the blood is incubated with different strains of streptococcus and pneumococcus. Sir A. E. Wright and his co-workers attribute the rise in bactericidal power to the greater efficiency of the leucocytes. Radiation of the skin with the ultra rays which have biological action produces some change in the blood causing increased bactericidal function. In many of the cases investigated in which subacute inflammatory changes occurred—i.e., No. 64—and in which there was chronic suppuration (116), the bactericidal power was very high indeed. In these cases the persistent mechanism of defence against the organisms can explain this phenomenon, for if the bactericidal power was low in these cases severe illness would result. In 41 cases in which the bactericidal power of the blood was investigated with test doses of light, 33 cases (80.5 per cent.) showed a definite increase from 2–35 per cent. Seven cases showed no change with radiation, and of these five cases had an initial bactericidal power of 98–99.5 per cent. The two remaining cases (Nos. 95 and 125) are of interest as neither showed any erythema after radiation, and when tested again seven days later with a dose of light-producing erythema they showed a marked increase in bactericidal power. One case of the whole series showed a lowering in bactericidal power. The dose of light employed in these preliminary tests corresponds to the minimal erythema dose as gauged by the test dosage armlet. There, therefore, appears to be a strong correlation between the bactericidal results and the erythema produced.

In carrying out these experiments on the effect of radiation on the bactericidal power of the blood, it was shown that heat rays and mustard poultices increased the hæmobactericidal power of rabbits. The heat had always to be sufficiently severe to produce a marked erythema and damaging of the skin before this phenomenon occurred. Prolonged use of a mustard poultice for one to one and a half hours over a large area of skin (the whole of the abdominal surface of rabbits) was necessary. Dr. Leonard

¹¹ Brit. Jour. Expt. Path., 1924, v., 54.

¹² THE LANCET, 1923, i., 417, 473.

Colebrook has failed to indicate an increased bactericidal power of the blood after the application of mustard plasters to the human skin. Table V. illustrates a series of results observed during the treatment of 60 patients.

TABLE V.

Case.	Diagnosis.	Dose of light.	I.K. units.	Av. % haemo-bactericidal power (1) before, and (2) after radiation.	
				(1)	(2)
1	Lumbago.	Back exposed to arc 20 min.	6	97.5	100.0 + 2.5
3	Tonsillitis.	C.b. ex. M.V.L. 5 min.	6	98.0	100.0 + 2.0
4	Lupus vulgaris.	C.b. ex. arc 10 min.	6	97.0	93.0 - 4.0
6	Anæmia.	C.b. ex. M.V.L. 6 min.	6	89.0	96.0 + 7.0
11	Colitis.	C.b. ex. to double M.V.L. 5 min.	6	70.0	81.0 + 11.0
14	Locomotor ataxia.	C.b. ex. to double M.V.L. 4 min.	5	88.0	96.0 + 8.0
15	Anæmia.	C.b. ex. M.V.L. 5 min.	6	86.0	92.0 + 6.0
16	Furunculosis.	C.b. ex. to double M.V.L. 5 min.	6	82.0	91.0 + 9.0
17	Asthma.	C.b. ex. to arc 10 min.	6	86.0	92.0 + 6.0
19	Tuberculous adenitis.	C.b. ex. to arc 5 min.	6	90.0	96.0 + 6.0
26	Lupus vulgaris.	C.b. ex. to arc 10 min.	6	97.7	99.2 + 2.0
29	Rheumatoid arthritis.	C.b. ex. M.V.L. 7 min.	8	96.5	98.0 + 1.5
40	Tuberculous adenitis.	C.b. ex. to arc 5 min.	4	99.0	99.0 -
42	Tuberculous peritonitis.	C.b. ex. to double M.V.L. 5 min.	6	95.0	97.0 + 2.0
45	Asthma.	C.b. ex. M.V.L. 7 min.	8	87.0	99.0 + 12.0
46	Bronchitis and ichthyosis.	"	8	97.8	99.2 + 2.0
55	Colitis.	C.b. ex. M.V.L. 3½ min.	4	97.0	98.8 + 1.8
58	Pharyngitis.	C.b. ex. M.V.L. 5 min.	6	82.0	92.0 + 10.0
60	Dermatitis herpetiformis.	C.b. ex. M.V.L. 4 min.	5	87.0	95.0 + 8.0
64	Subacute arthritis.	C.b. ex. M.V.L. 5 min.	6	99.0	99.0 -
67	Lupus erythematosus.	Back ex. 3½ min.	2	94.0	96.0 + 2.0
68	Psoriasis.	C.b. ex. 5 min.	6	84.0	98.5 + 14.5
71	Phthisis.	C.b. ex. M.V.L. 4 min.	5	58.0	93.0 + 35.0
75	Anæmia.	C.b. ex. M.V.L. 3½ min.	4	98.0	98.0 -
77	Lupus erythematosus.	"	4	62.3	74.8 + 12.5
78	Emphysema and asthma.	C.b. ex. M.V.L. 4 min.	5	91.0	94.0 + 3.0
82	Tuberculous knee-joint.	"	5	75.0	90.0 + 15.0
83	Rheumatoid arthritis.	C.b. ex. M.V.L. 5 min.	6	90.3	92.7 + 1.6
88	Lupus erythematosus.	C.b. ex. M.V.L. 3½ min.	4	88.0	93.0 + 5.0
92	Phthisis.	C.b. ex. M.V.L. 4 min.	5	92.0	99.5 + 7.5
93	Colitis.	C.b. ex. M.V.L. 5 min.	6	98.0	98.0 -
95	Sinusitis.	C.b. ex. M.V.L. 3½ min.	4	88.0	88.0 -
97	Asthma and eczema.	"	4	99.0	99.5 + 0.52
102	Debility.	C.b. ex. M.V.L. 5 min.	6	99.5	99.5 -
106	Parenchymatous goitre.	C.b. ex. to double M.V.L. 4 min.	5	82.6	83.2 + 0.6
114	Tuberculous adenitis.	C.b. ex. M.V.L. 4 min.	5	83.0	100.0 + 17.0
115	Scleroderma and colitis.	"	5	85.0	100.0 + 15.0
116	Osteomyelitis of rib.	C.b. ex. M.V.L. 5 min.	6	99.5	100.0 + 0.5
120	Tuberculous ankle.	"	6	90.0	97.0 + 7.0
124	Sinusitis.	"	6	89.0	98.0 + 9.0
125	Pharyngitis.	C.b. ex. M.V.L. 4 min.	5	86.0	86.0 -

C.b. ex. = Chest and back exposed.

Remarks.—Case 4: Patch of lupus exposed. Case 6: Yellow skin erythema. Cases 14 and 16: Marked erythema. Case 19: Yellow skin (Japanese) erythema. Case 67: Fair skin, light sensitive erythema. Case 75: No skin reaction. Case 95: No erythema after light dose. Case 106: Very slight skin reaction; sallow complexion. Case 125: No reaction of skin after radiation.

Individual and Regional Sensibility to Light.

There is a very marked difference in the degree of erythema of the skin produced by the same dose of light. Fair-haired people are, as a rule, more sensitive than dark people; but this usually applies to large doses of light and is not very apparent with smaller doses. In carrying out the test dosage of the abdominal skin, a high red index, 1.3 and 1.4, and low yellow index, 1.0, usually signifies sensitive-

ness to light. The skin bearing a high yellow index of 1.2-1.4 is rarely sensitive to light. The soft thin white skin, which sweats readily and easily bruises, is very often sensitive to radiation. Another easy method of detecting light sensitiveness is by means of transillumination of the air sinuses or of the skin. A very brilliant "red reflex" on ophthalmoscopic examination often signifies sensitiveness to light.

The degree of erythema produced by light varies considerably and this can be roughly classified in the following way: (1) Erythema which is just visible and usually disappears without any apparent sequelæ in one to two days. (2) Erythema which is readily perceptible, followed three to four days later by fine desquamation and results in faint pigmentation. (3) Erythema which shows a violent bluish flush, tender and hot on palpation, with slight œdema and raised hair follicles. This is followed by massive desquamation and results in a deep persistent pigmentation. (4) Erythema causing much pain and resulting in blistering and its sequelæ.

The different areas of the body vary extensively in their sensitiveness to radiation. The inner side of the arm and thighs are the most sensitive. The popliteal space, the side of the chest and back are the other sensitive sites of the body. The skin remaining after desquamation is extremely sensitive to light, and often a small dose of light (2-3 I.K. units) will produce a severe erythema and hemorrhagic vesicles. The skin should therefore be rested for a while after the period of desquamation. Areas of vitiligo are more sensitive than normal skin; scleroderma is very resistant to radiation and only reacts with very slight erythema.

Dr. L. Colebrook¹³ has shown that excessive dosage with light will produce a very marked decrease in the bactericidal power of the blood. The extent the luminous and heat rays take in producing this damage is not yet definitely decided. But in many animal experiments in which rabbits were inoculated so as to produce conditions of septicæmia, excessive dosage with light appeared to hasten death. In all cases of acute infections and in very sick patients, the dosage with light can be carefully controlled by means of the bactericidal test. Prolonged exposure to arc lamps increases the risk of overheating the body by means of the luminous rays. Many light-sensitive patients experience headache, sickness, and dizziness on exposure to light. This is followed by general malaise with or even without the presence of marked skin erythema. It is very difficult to determine whether this sensitiveness is mainly due to the ultra-violet or luminous heat rays. They usually appear to tolerate the mercury-vapour lamp better than the arc lamp.

Light Adaptation and Pigmentation.

Pigmentation and adaptation to light follows after repeated radiation. The nature of the colour of the pigment deposited varies with the source of light. Patients exposed to sunlight and the Finsen arc usually show a deep black-brown pigment. The long flame arc and tungsten carbons give rise to a reddish-brown pigment. The mercury-vapour lamp produces a yellowish-brown pigmentation. Karl Dorn¹⁴ showed after many years' investigation at Davos, that in winter there is considerable heat intensity with minimum ultra-violet energy. In spring there is the greatest heat energy with less increased ultra-violet energy. In the summer there is great heat energy and the maximum ultra-violet energy occurring simultaneously. In the autumn there is great heat energy and a comparatively strongly maintained ultra-violet energy. He therefore concludes that the heat intensity fluctuates very little in the high mountains, but the ultra-violet intensity shows great variation according to the time of day and the time of year. The heat and ultra-violet energy—measured on an arbitrary scale and not in

¹³ THE LANCET, July, 1923.

¹⁴ Study of Light and Air of the High Mountains, 1911.

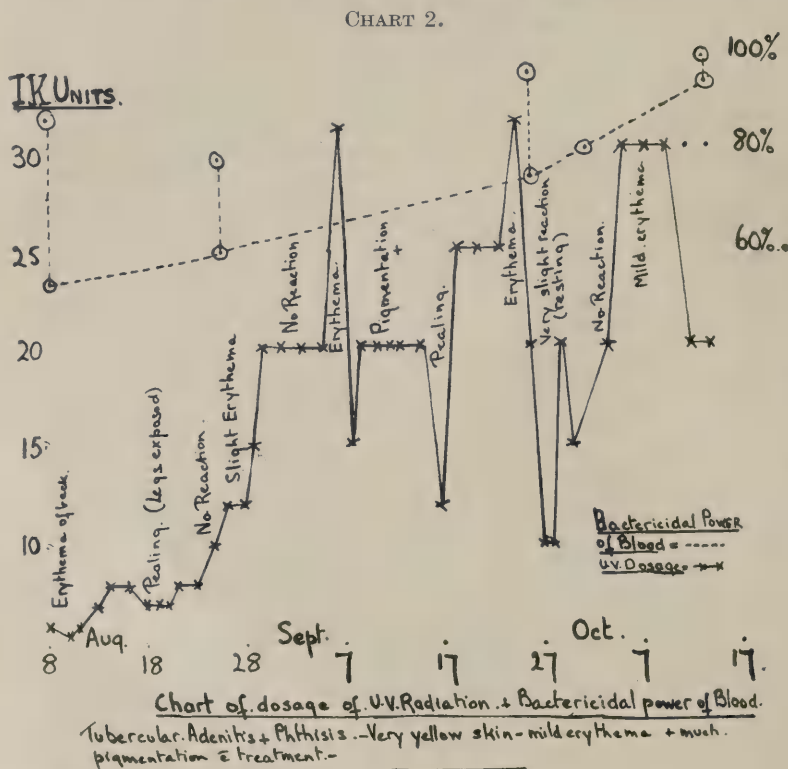
actual energy—are equal to one another on July 15th; the heat at noon on Jan. 15th is ten times as great as the ultra-violet radiation. The autumn sun is double as rich in ultra-violet radiation as the spring sun.

Drs. L. Hill and Argyll Campbell have shown that a suspension of melanin will completely screen the frog's mesentery against the action of the ultra-violet rays and that melanin is not a sensitiser.

The fact that pigmentation can be produced apart from light and also by means of heat rays suggests that pigmentation is not specific to the biological action of light. It appears to be closely allied to the heat and luminous rays, since it is more apparent with radiation of the warm sun and the prolonged exposure to arc lamps (one to two hours). The short ultra-violet rays appear to have the power of changing the distribution of the pigment so as to alter the colour of the skin. As the degree of pigmentation increases the sensitiveness to ultra-violet radiation usually diminishes, and light dosage must be increased. As a general working rule an erythema of the skin produced by light gives rise to an increased bactericidal function. It is therefore more advisable to utilise a scheme of dosage which results in the slow production of pigmentation, but definite erythema. This can usually be achieved by utilising a very great intensity of ultra-violet energy, and to avoid overheating of the body by using a short and intense dosage.

The dose of light over the irradiated area is controlled by the degree of erythema produced. During the stages of desquamation the skin is rested, so as to avoid excessive dosage which rapidly results in accustoming to light. A dose of light consisting of 12 I.K. units would correspond to 60 minutes' exposure to the Finsen arc.

M.V.L. M.V.L. Arc. Arc.
(4 + 4 + .2 + 2 = 12)

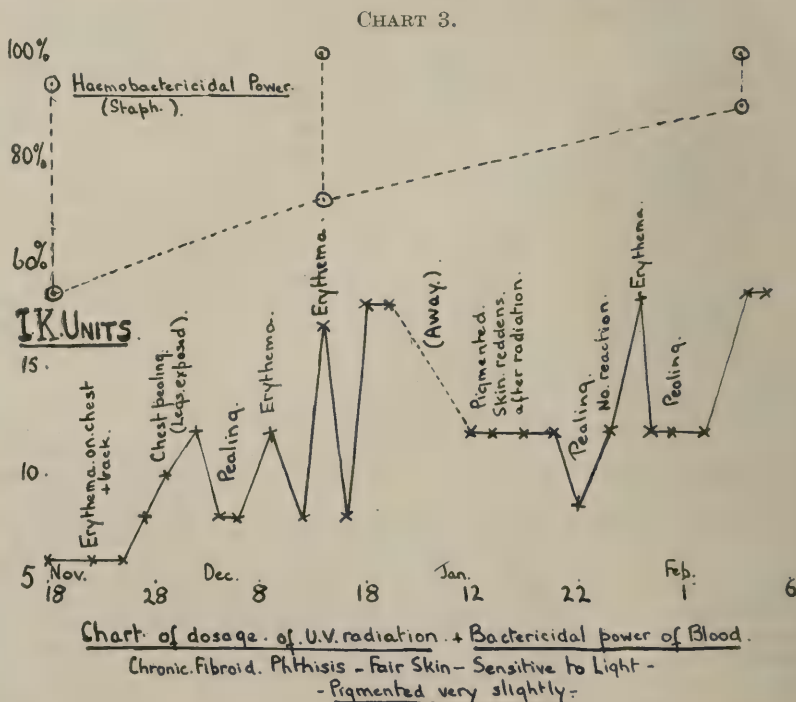


O. Bernhard¹⁵ has shown that marked erythema of the skin occurs in the winter in the glacier regions, and that the most marked pigmentation is seen in the spring. He therefore maintained that pigmentation is prevalent at the time of greatest heat intensity and less increased ultra-violet energy. The chief function of the pigment melanin is to form a protective screen in the skin against excessive penetration of the luminous rays. There is no evidence to support the views of Rollier and Christen—that melanin is an optical sensitiser, similar to eosin and erythrosin.

Pigmentation is an effective screen to the action of the ultra-violet rays and prevents their biological action. Rost¹⁶ has shown that skin areas repeatedly exposed to the Kromayer lamp become insensitive to light independent of the degree of pigmentation. There is no method available at present to determine the degree of pigmentation in any definite units, and therefore it is difficult to draw conclusions on the relation of pigmentation and light protection. Dr. P. Keller has demonstrated the following interesting points: (1) The development of ultra-violet pigmentation is independent of that of tolerance; (2) pigmentation alone does not imply light tolerance; (3) ultra-violet tolerance is possible without pigmentation.

¹⁵ Strahlentherapie, 1919, ix., 520.

¹⁶ Deutsche med. Woch., 1918, xxvii.



The amount of heating of the body is, by use of these means, much reduced. In all the cases under observation the degree of pigmentation is slight, and the dosage of light is controlled by the erythema response following radiation. Although it is impossible to decide the issue conclusively, in many cases pigmentation appears to be indicative of therapeutic action of the ultra-violet rays. The reaction of the skin to light, in the production of erythema which in a mild degree appears to be beneficial and in the production of pigment, can be controlled by carefully graded and regulated dosage.

Charts 2 and 3 indicate the dosage of light adopted in a series of cases under investigation. The dose of light is expressed in terms of infusoria-killing units, in the method previously described. In all these cases the light sensitiveness of the skin was first tested and a bactericidal test was carried out, with an estimated erythema dose of light. The chest and back were first exposed to the double mercury-vapour lamps and at each alternate sitting the front or back of the legs were exposed. When the skin became insensitive to 6 I.K. units with the M.V.L., exposure to the double arc was started. This was found to be of great value in the fair-skinned patients, as a very mild superficial pigmentation was present. In all cases exposure to light was stopped during the stages of desquamation, and a sufficient interval of rest was given to allow the newly-formed skin to "harden." The dosage of light was controlled by the reaction of the skin. The aim of dosage was to produce a mild erythema of the skin with each dose applied. In all these cases pigmentation was slight, and the sensitiveness of the skin was maintained during the whole course of treatment. At periodic intervals during the course of treatment, further bactericidal tests were carried out. The general conclusions from the tests showed that in cases where the hæmo-bactericidal power was low, a steady improvement could be established. The erythema dose produced increased bactericidal power in the blood.

SUCCESSFUL RESEARCHES IN THE TREATMENT OF INFANTILE PARALYSIS.

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EXPERIMENTAL treatment of infantile paralysis, carried out recently at the Heritage Craft Schools at Chailey, having been attended with marked success, it seems advisable to publish the results in order that it may be established at other institutions dealing with this affliction of childhood. Improvements will undoubtedly be made in the near future on the methods about to be described; in fact, they are already in mind, but for the reason stated above the writer has been induced to place the work upon record at its present stage.

The cases selected for treatment were, as will be seen below, children some of whose muscles gave no response to the interrupted galvanic current. Moreover, the acute attack resulting in the degeneration of the nerve-fibres had taken place so many years before that, acting on experience gained from the practice of massage and electrical treatment alone, one would have said that further measures with a view to restoring the function of the paralysed part would hardly be justified. At the same time palpation gave the impression that the muscles had not completely atrophied.

These cases having been selected, the treatment was begun on the dates given and has been carried on to

the present time. The following measures were adopted:—

1. General radiation of the skin by artificial sunlight. (Occasionally the real sunlight was used, but during the past year this has been so seldom available that nine-tenths of the treatment has been given by artificial means.)
2. Local treatment of the affected muscles by rays from long ray lamps passed through red filters.
3. Electrical treatment.
4. Re-education of voluntary stimulus.
5. Instrumental support for the paralysed muscles and then (most important) abandonment of support, in some cases at an early stage. The writer would call particular attention to this matter which is referred to in detail below.
6. Massage.

The deductions which led to the adoption of the above methods of treatment are simply explained as follows:—

General Application of Artificial Sunlight.

Several years ago the writer began to treat rickets in children by means of artificial sunlight. Observation showed that children suffering from active rickets were frequently also suffering from acute neurasthenia. The active symptoms of rickets cleared up very quickly under the administration of the light, but the neurasthenic symptoms were the first to disappear. The deduction drawn from these observations was that neurasthenia and rickets are sometimes causal relatives. Rickets is caused by light starvation, so is neurasthenia. The writer believes that neurasthenia in the adult is a symptom frequently due to the lack of antirachitic substance at a time of life when the complete formation of the bone renders the bony symptoms impossible.

Following these observations he has successfully treated many cases of neurasthenia in adults by artificial light. Thus the disturbance of nutrition in the nerve-centres due to lack of antirachitic substance may be the cause of neurasthenia, and the cure found in the general treatment of the body by light. This would mean that the matter formed by the action of sunlight on the skin is a factor in the nutrition of the nerve-centres as well as of the bones.

With these observations clearly in mind, the writer turned his attention to the treatment of infantile paralysis. This acute infection produces a severe shock upon the whole nervous system. The hæmorrhagic myelitis leads to the total destruction of a smaller or larger number of motor nerve-cells, while at the same time many suffer a temporary suspension of their activities by disturbance of their nutrition in a varying degree, owing to compression. Thus some may recover function in a few days or weeks, others may lie sick and dormant for a longer period, and may lose their axons, which subsequently regenerate following revitalisation of the cell centre. After these attacks we also notice symptoms in the patient that are probably produced by neurasthenia.

Now the muscular atrophy following an acute attack of anterior poliomyelitis is intense, and in those cases where extensive degeneration of the axons has taken place, and has been followed by regeneration, the young axons, when at last they enter their muscular destination, find fibres in such an extreme state of atrophy that no response to the motor stimulus is obtained from them. The atrophied muscle-fibres are shrivelled up, the skeletal elements have lost their elasticity, and the contractile substance appears to have been largely absorbed, so that the nuclei have come together in heaps.

Under the action of light, changes take place in the skin resulting in the formation of the substance mentioned above which is carried away by the lymph and distributed throughout the body by the blood. This we may call the antirachitic substance. It has an intensely active rôle in the promotion of nutrition. Its absence produces the rachitic condition in the bones of growing children and neurasthenia due to the exhaustion of the nerve-centres, while its production by the action of light on the skin results in the re-composition of the rickety bones and the re-nutrition of the nerve-centres.

General Radiation.

So the writer started to treat his paralysed patients by the general application of natural and artificial sunlight to their skins, thinking that of all illnesses there is none so urgently demanding this treatment as acute anterior poliomyelitis. This treatment was given strictly in accordance with the principles laid down by Rollier for treatment by real sunlight, the chief of these being the avoidance of excessive or widespread erythema and a dosage regulated to the tolerance of each individual patient. This artificial light has been produced by the combination of the mercury-vapour lamp and a battery of the long-ray lamp bearing the writer's name, with the red screens in operation.

Having carried out treatment on a very large number of patients suffering from a variety of complaints, with different open arc lamps, the writer now feels confident of the complete superiority of this combination of mercury-vapour and incandescent filament lamps over the open arc lamps. The dosage of the patient with ultra-violet rays can be regulated with much greater accuracy with the mercury-vapour lamp than with any of the open arcs, while the treatment of the patients in the recumbent position is much simpler and better.

It will be seen that the efficient reflexion of the rays from the parabola of the writer's lamp is a most important factor when the shallow penetration of the ultra-violet rays is borne in mind, as the parallel rays from the parabolic reflector striking the skin (as nearly as can be arranged) at right angles penetrate more deeply than the majority of the rays coming directly from the source of the light because most of these rays penetrate the skin in an oblique direction and are consequently arrested nearer the surface.

The reflected rays being therefore of greater importance than the direct rays the advantage of the removable reflector fitted to this mercury-vapour lamp is manifest, as only the daily removal of the reflector for polishing can ensure efficiency of reflection. A nickel surface may be used, and in polishing this, extreme care must be taken that it is not scratched, because scratches particularly impair the reflection of the ultra-violet rays.

In regulating the dosage of ultra-violet light it is well to avoid over-pigmentation of the skin, as a dense pigmentation checks the penetration of the red rays. The writer aims at a moderate pigmentation. Here again most of the open arc lamps are at fault as they produce excessive pigmentation in some patients. This pigmentation is a needed protection when only real sunlight is used, because the proportion of heat and visible rays in sunlight is such that people exposed to them for long periods need something to moderate these waves. When artificial light is used this should not be necessary, and if penetration by red rays is required it is an impediment.

Rollier, supported by Gauvain, has pointed out to us that patients who pigment deeply under sunlight treatment respond better to the treatment than those who do not pigment. The writer is inclined to believe that this observation need not be interpreted as meaning that the pigment itself is the curative factor. It has been shown that the phenomenon of pigmentation is connected with certain endocrines—e.g., pituitrin. It is therefore possible that the "non-pigmenter" does not react to treatment simply because his endocrine production is abnormal, and not because he lacks pigment.

Local Treatment by Red Rays.

The long-ray lamps already alluded to consist primarily of a carbon filament in vacuo, the bulb of which is made of glass. These lamps are specially constructed for the writer by makers of electric filament lamps, as it was found that they were unobtainable. They yield a light much richer in red and infra-red frequencies than the metal filaments in gas-filled globes made for lighting purposes, and the writer

was anxious to obtain red rays for the local treatment of the muscles.

The red rays penetrate the tissues much more deeply than the heat rays, because the latter are absorbed by water. The depth of their penetration is demonstrated by the simple experiment of holding the hand in the path of a sunbeam entering a room through a window. The red light will be seen plainly to penetrate the fingers. In order to give a strong dose of red light screens of red glass are fitted to the lamps. These screens cut off enough of the heat rays to enable a much stronger dose of red light to be given to the patient than would be possible without the screens. The red rays themselves produce heat but to a lesser degree than the infra-red.

The writer has found these red rays of the greatest value in the treatment of atrophied tissue and, judging by the results obtained in treating tissues exhibiting chronic inflammation, he has concluded that they produce in these tissues an increased power of resistance and repair, and it is perhaps not unlikely this effect is obtained through the local stimulation of the sympathetic nerve-fibres. There is certainly no comparison between this therapeutic effect of rays from the filament lamps that have been passed through the red screens and the same rays unfiltered, when in each case the dosage of light has been the maximum compatible with comfort and safety for the skin.

In the treatment of rheumatoid arthritis by artificial light the redevelopment of the wasted muscles became very marked when the writer began to use intense red rays. The above observations led to the adoption of this red ray treatment for muscles affected by acute anterior poliomyelitis, and the results given below surely prove its value. From 20 minutes to half an hour daily exposure was given locally to each affected group of muscles, the rays from the mercury arc being given to the body generally as a separate treatment. The writer believes that the time allowed for the local treatment of the paralysed muscles by the red rays might well be increased beyond the limits stated above.

Electrical Treatment.

The rationale of electrical treatment in infantile paralysis has been fully described by the writer in a paper read before the British Orthopaedic Association in October, 1922, and subsequently published in the *Journal of Bone and Joint Surgery* of April, 1923, where it is pointed out that in considering the re-nutrition of muscles there is an important point that has always been overlooked and is essential to the restoration of contractility. It is explained by the theory of muscle contraction given by Schaffer.

When a muscle contracts, the clear contractile substance passes into the tubules of the sarcous element, which are elastic and are dilated by its entry. When the muscle is relaxed, this substance flows out of and remains outside the sarcous element, the little tubes narrowing as they elongate. As long as the muscle remains in a state of complete relaxation—for example, when elongated during paralysis—the little tubes remain in this posture. It appears to the writer that the atrophy following the paralysis besides causing absorption of the contractile substance is accompanied by a loss of elasticity in the sarcous element, so that the tubes can no longer dilate to their proper extent to admit the contractile substance for the contraction of the muscle in response to a stimulus. This loss of elasticity may be partial, leading to an impairment of contractility in the muscle, or if allowed to progress far enough, such rigidity is the result that dilatation is impossible and contractility is altogether lost. The above theory is absolutely in accordance with observed facts, and it will be seen that it is a separate condition apart from the mere loss of contractile substance.

In lesions of the lower neurone these changes take place more rapidly in young children than in older children and adults, so that in their case it is very needful to begin treatment early. But in any case

there is really only one way absolutely to safeguard these paralysed muscles from this dire catastrophe—that is, to ensure a periodical contraction during paralysis, and the only way to ensure this is to employ electrical stimulation. There are no other means. The greatest care must be taken, however, not to over-exercise the paretic muscle. This is a very important point. A dozen good contractions daily for each muscle are sufficient in the early stages.

The cause of failure of electrical treatment in infantile paralysis lies too commonly in ineffective methods of application, and this leads to erroneous opinions held on the subject by those who observe the results. Treatment directed to an increase of the circulation in the affected limb yields good results up to a certain point, and undoubtedly improvement of nutrition in the limb as a whole takes place when, for instance, it is periodically immersed in a faradic or sinusoidal bath, but as a measure for preserving or restoring contractility of paretic muscles it fails because muscles most affected, and therefore most in need of the treatment, either do not respond to faradic at all, or at the best but feebly, while the normal muscles contract strongly and may do actual harm by stretching their weaker neighbours. This latter evil can be avoided by splintage during the treatment, but this is a difficult matter when a bath is used and a precaution rarely carried out.

It has already been stated that wasting and loss of contractility proceed more rapidly in young children than in older patients. This renders effective treatment the more urgent in their case, especially as the limb will be increasing in length. It cannot be too strongly urged that paralytic muscles should be treated only by operators who have learned this particular work under proper supervision in a school dominated by orthopaedic ideas.

Re-education.

Re-education was very carefully carried out. It is most important that the patients should not be exhausted and discouraged by exhortation to contract muscles that will not and cannot respond. Patience should therefore be exercised and re-education withheld until the proper time has arrived, and it should then only be gradually and intelligently carried out. For instance, the long extensors of the toes must not be used instead of tibialis anticus in dorsiflexing the foot.

Instrumental Support.

Instrumental support was considered from an entirely new standpoint, as the writer believes that although it is of paramount importance properly to relieve a paralysed muscle of all tension until voluntary response is restored, yet it is a form of treatment very much overdone. When voluntary response is regained support must be discarded at times altogether, these periods varying according to the state of the neuro-muscular combination at the time being.

There are two points the writer would like to make particularly clear as they are taken into constant consideration, and he regards them as essential. The first of them is that so long as a paretic and wasted muscle is inactivated by a supporting appliance it will rarely regain useful activity, and it will rarely regain sufficient tone owing to the effect of such fixation upon the factors concerned in its production.

The second point is that whereas the constant pressure of the enveloping band or strap of a surgical appliance will cause severe wasting in even a normal muscle, such a factor has a far more serious effect upon a paretic muscle, and should never be allowed. Thus, when the quadriceps muscles are affected in anterior poliomyelitis and a walking calliper is used, flexion of the knee-joint should be prevented by a band passing over the front of the knee only, the straps commonly used, which pass over the quadriceps muscles, being very harmful.

When voluntary response has been regained in the quadriceps the writer has, with certain exceptions, discarded the calliper altogether, believing this to be the best procedure, so long as the psoas and glutei were activating, and allowed the patient to get about with poles or crutches according to the necessities of the moment. In such cases it is easy in this way to let the patient get about without support for the quadriceps muscles if a little care is exercised. The anterior tibial muscles, however, present a more difficult problem, owing to the tendency of the foot to drop into the equinus position during the day (so that some supporting appliance is needed), and to be forced into this position at night by the weight of the bedclothes. Thus a night shoe (keeping the foot at right angles with the leg with slight inversion) should be worn to a late stage, and the masseuse should constantly correct any tendency to shortening of the calf muscles. Should this condition be present in a marked degree when treatment is first begun, much valuable time will undoubtedly be saved by a tenotomy of the tendo Achillis, as in the writer's experience it is impossible permanently to reduce an advanced contraction of the calf muscles by physical means alone.

Before leaving the subject of supports, let it here be said that enveloping plaster-of-Paris splints were never used as these encourage atrophy by depriving the part of all light and air.

Massage.

Massage was carried out as a part of the treatment. In cases where atrophy is advanced it is of use, yet the more the writer uses sun rays, real and artificial, in treatment, the less he is inclined to employ massage. He always has in mind the danger of pulling the inert muscles out of shape in this form of treatment done day after day. This remark more especially applies to deep effleurage which is, in his opinion, a grave mistake. Massage is chiefly needed in cold weather.

Clinical Records.

F. T., aged 13, had an acute attack of anterior poliomyelitis when aged 14 months. Treatment was begun in January, 1924. He had then no faradic or voluntary response in the right quadriceps muscles. On Jan. 28th, 1925, he had regained a good voluntary response in these muscles, varying a little from day to day, but at times he can hold the leg with the knee extended with his thigh in a horizontal position. He is still steadily improving.

J. C., aged 12, had an acute attack of poliomyelitis in early infancy. In February, 1924, all muscles and all muscles of the right lower limb excepting the adductors gave no faradic or voluntary response. Treatment was started on that date. On Jan. 28th, 1925, there was a plain voluntary response in the quadriceps, the response being, however, weak. The glutei gave a good voluntary response, and they are becoming quite strong so as to give really useful activity. The hamstrings have recovered sufficiently to flex the knee-joint through the right angle with the patient lying in the prone position. The peronei have a weak but distinct voluntary response; the tibialis anticus is beginning to give voluntary response; all these muscles are improving.

W. B., aged 11, had an acute attack of poliomyelitis in both lower limbs when 4 years old. In January, 1924, there was no response in the left quadriceps. On Jan. 28th, 1925, these muscles have a weak response almost but not quite strong enough to support the weight of the leg in the horizontal position. The left anterior tibial group were very weak, but are now recovering rapidly; it is to be expected that at the present rate of progress this boy will be able to discard his instrument altogether. In the right leg in February, 1924, tibialis anticus gave no faradic or voluntary response. On Jan. 28th, 1925, it now gives a really useful voluntary response, almost sufficient to dorsiflex the foot. In this case there had been considerable contraction of the calf muscles on both sides so that he had been earmarked for tenotomy. The muscles have, however, completely yielded to manipulation so that the foot can now be placed at a right angle. The remarkable feature of this case is the splendid nutrition of both legs, which have developed excellently in this respect.

T. W., aged 15, had infantile paralysis when less than a year old. On Feb. 26th, 1924, no faradic or voluntary response was obtained in the anterior tibial group or the quadriceps muscles on the right side. On Jan. 28th, 1925,

the quadriceps and all the muscles of the anterior tibial group were beginning to give a voluntary response. Atrophy in this case had been very severe, but he has lately much improved. On the left side tibialis anticus gave no faradic or voluntary response at first, but is now giving voluntary response.

Conclusions.

It is, of course, necessary that treatment of such cases as these should be continued over a long period in order to obtain a useful result, that is to say, to establish activation in the paralysed muscles so that they can assume their proper rôle without the support of any appliance.

When we consider that ten years is not thought too long a period for the mental tuition of these children during the greater part of every day, it is surely a very reasonable thing to demand treatment for three-quarters of an hour or so daily for three or four years, because this can very easily be done in establishments especially devoted to the welfare of cripples where they are resident and always available when required for treatment. The above cases have been selected for inclusion in this paper because they have shown a recovery of muscles that were completely paralysed at the beginning of the treatment and are therefore the strongest possible proof of the value of the methods adopted, but while their treatment has proceeded other patients have been treated in the same way, whose muscles were activating very weakly at the beginning of treatment and have shown quite exceptional recovery.

The writer has treated a very large number of cases of infantile paralysis at different hospitals for some years past by the methods mentioned above, excepting the general light treatment and the local treatment of the muscles by the red rays, and he has never obtained results that can be compared with these just described, nor has he seen such results elsewhere. The treatment by light therefore stands out very distinctly as a great advance. Among the cases hitherto regarded as hopeless there are unquestionably a large number in which destruction of innervation renders recovery impossible, and treatment is, of course, thrown away on these. At the same time, examination and a short course of treatment will show whether useful recovery of nerve-fibres has taken place.

Much skill, perseverance, and judgment are required on the part of the operators. The writer must therefore pay a tribute to his assistants, Miss F. Rolleston and Miss I. Seldon, who have been responsible for the carrying out of the above methods.

RHEUMATIC INFECTION IN CHILDHOOD.

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FIFTY cases, picked at random from a much larger series of Bath school-children selected during routine school inspection and clinic work, either because of heart disease, suspect heart disease, or symptoms suggesting rheumatic infection, have been examined, and 44 in whom the diagnosis was established to the clinical exclusion of other toxic states are reported upon fully. The detail embarked upon negated the possibility of investigating a larger series. School medical records since 1920, compiled by one of us, were available, and each case in the present series was seen more than once in consultation. The inquiry into home conditions and house inspection was made by voluntary school-care visitors under the direction

of the Care Secretary, Miss E. G. Greenall, and the reports were according to a very detailed schedule.

The subject is discussed from the viewpoint of the soil, including inheritance, family history, past history and physical make up of the child, and environment; and the infection, including subjective symptoms, duration of ill-health, and objective physical signs.

In Respect of the Soil.

Inheritance.—Of the 44 cases diagnosed as suffering from rheumatic infection 21 had an adjacent and 14 a remote family history. By adjacent is meant definite rheumatic fever or rheumatic chorea in either parent, brother, or sister. By remote is meant "rheumatism" in the above relations, or rheumatic fever in a grandparent, uncle, aunt, or first-cousin.

Family Colouring.—The colour of the hair in the above adjacent relations was nondescript in 19, definitely fair in 10, definitely dark in 9, definitely red in 6.

Colour of hair in the cases under review was nondescript in 23, definitely fair in 13, definitely dark in 2, definitely red in 6.

Past history of the same cases: Rheumatic fever in 6, chorea in 11, scarlet fever in 5.

Environment.—Altitude of house: Under 100 ft. in 27 (61·3 per cent.) instances, under 200 ft. in 40 (90·9 per cent.) instances. In only 6 instances was residence in the present house under 3 years—in the remaining 38 cases the residence had been unchanged for over 5 years.

Subsoil.—Alluvial, 13; gravel, 15; lias, 12; other types, 4. The gravel in the majority of these cases is in an area adjacent to the river-bed and used to be flooded.

House Reports.—Damp, 20; ventilation inadequate, 14; light poor, 12. The terms dampness, inadequate ventilation, and poor light are those which would be, and in point of fact were, applied to conditions striking an ordinary educated person and not a sanitary inspector. In only 6 instances could the term overcrowding be applied to relation between the number of inmates and available rooms. Six houses only had under 4 rooms, 16 houses had 4 rooms, 9 houses had 5, and 13 had 6 or more.

The weekly gross income per head is as follows: In no case was it less than 5s.; in 21 cases it was between 5s. and 7s.; in the remainder it was over 7s. In practically every instance the parents of the affected children were in steady work, in receipt of a steady income, and generally belonged to the skilled artisan section of society.

In Respect of the Infection.

A history of symptoms in the children was given as follows: Headache in 10, sore-throat in 12, stomach-ache in 26, stiff neck in 8, growing pains in 31, stitch in 26, swollen joints in 3.

The nervous symptoms in the children were: Irritability in 5, nervousness in 14, sleep disturbances in 20, those of chorea in 4.

The duration of symptoms in the children was: Less than 1 year, 10; 1 to 2 years, 11; 2 to 5 years, 17; more than 5 years, 4; unknown, 2.

Physical Signs.—Pallor and anaemia are not recorded in that blood counts were not undertaken. In 16 cases the condition of the tonsils was such as to cause chronic enlargement of the submaxillary tonsillar gland.

The cardiac condition in the children was: Morbus cordis in 14, suspect cardiac disease in 22, normal cardiac state in 8.

Subcutaneous nodules were present in 35 children, chorea was present in 6.

The following table explains the association of the principal physical signs:—

Rheumatic infection—				
Without physical signs	..	..	..	5
+ nodules	..	..	..	3
+ chorea	..	..	..	0
+ nodules + chorea	..	..	..	0
+ C.I. (a)	..	..	..	0
+ " (b)	..	..	..	3
+ nodules + C.I. (a)	..	..	..	16
+ " " (b)	..	..	..	11
+ chorea + C.I. (a)	..	..	..	1
+ " " (b)	..	..	..	0
+ nodules + chorea + C.I. (a)	..	..	..	5
+ " " (b)	..	..	..	0

C.I. = Cardiac involvement. (a) = Suspect; (b) = Organic.

Examination of Controls for Subcutaneous Nodules.—At routine school medical inspection among the first 100 children examined 25 were found to have nodules, 20 of whom gave a definite history of symptoms suggesting rheumatic infection, 2 an indefinite history, and 3 no history. These children were of the entrant and intermediate groups and accompanied by their parents.

Commentary.

Several salient points emerge touching environment and infection.

In Respect of Environment:—

(a) Altitude and subsoil: The figures are remarkable and require no comment. It is to be noted that the altitudes in Bath vary between under 100 feet to over 500 feet.

(b) Social position of the parents: Is not one of extreme poverty and slum dwelling, but that pertaining to a more or less skilled worker in constant employment. This directly opposes the suggestion that rheumatic infection is a poverty disease.

(c) The family inheritance and predisposition is confirmed.

In Respect of Infection:—

(a) Nervous symptoms: The frequency in which the parents' sole complaint was that the child was nervous and irritable, or was a sleep-talker and sleep-walker, or that there was a combination of these symptoms is remarkable. Seeing that efficient anti-rheumatic treatment cured these conditions it would appear that they are manifestations of the rheumatic virus.

(b) Subcutaneous nodules: As a physical sign the subcutaneous fibrous nodule is a small and apparently insignificant variation from the normal, in consequence of which practice is necessary for the clinician to be certain of its presence. The final proof that such nodules exist rests on their removal and microscopical section.

To quote from Prof. I. Walker Hall's report¹:—

"The nodule is composed of fibrillar tissue, aggregations of histiocytes and inflamed blood-vessels. . . . It is obvious that the aetiology of the nodule may be associated with a persistent irritant of the sub-infective or mildly infective type."

This particular reaction to infection, proliferation of the lining endothelial cells of arterioles and perivascular collections of histiocytes, is such as obtains in response to the virus of rheumatic fever, both in the endocardium and pericardium. It would appear therefore not improbable that these nodules are but pocket editions of the large subcutaneous nodes occurring in acute rheumatic fever and are analogous to the submiliary nodules of Aschoff.

(c) Treatment: It has been found that satisfactory results are more easily obtained by the exhibition of small doses of thyroid or iodine in addition to salicylates, alkalis, and arsenic. This treatment was adopted on the presumption that smouldering infections tax the thyroid gland. Rest, exclusion from school, and avoidance of wet were enforced where necessary.

Summary.

Forty-four cases of rheumatic infection in children have been investigated. The opinions reached are:

1. Rheumatic infection in elementary school-children is not a poverty disease.
2. It is extremely prevalent among such children.
3. The potency of heredity and low-lying locality is emphasised.
4. Subcutaneous nodules have been demonstrated in 35 out of 44 cases (79.5 per cent.), and are significant of an active rheumatic focus, as shown by their association with symptoms and their absence in three cases of stationary mechanical carditis formerly rheumatic. Thus their presence not only crystallises an otherwise nebulous diagnosis, but indicates the necessity of continuation of treatment, particularly in nervous children and in those with unsatisfactory cardiac sounds.

We wish to thank Miss Greenall and the voluntary care visitors under her supervision for their most valuable reports and scrupulous attention to detail, without which this investigation could not have been made.

¹ Brit. Med. Jour., 1925, i., 550.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF MEDICINE.

WEDNESDAY, JULY 22ND.

Lord Dawson, President of the Section, in his inaugural address referred to the especial importance of the 1925 meeting of the Association. There were, he said, three things that made it notable—the meeting coincided with the important outcome of recent research into malignant disease; it was held at a time when the duties of the Association were rapidly widening, especially as they affected facilities for learning and teaching and promoted generally the health of the public; and it was held at Bath, which for so long a time had been a leading health centre of the country. Referring further to cancer research, he pointed out that the specificity of the factor of the soil, as opposed to the non-specificity of the virus, illustrated once again the principle that the reaction of man to morbid processes bears upon it the stamp of his own individuality. Modern medicine was opening out the questions of trend and tendency, and as a result medical men of the future must increasingly be the prophets and not the vassals of statesmen. The President then referred with great respect to the late Sir Clifford Allbutt, both as a great thinker and a great leader, and especially as a leader to the B.M.A. during the years of the war. He reviewed his great knowledge, broad outlook, and fine scholarship, and, most important of all, his sane optimism, which had made him pre-eminently an object of the allegiance which age might command in the young.

Sir Humphry Rolleston, after reference to the remarks of the President upon cancer research, and having paid further tribute to the memory of Sir Clifford Allbutt, opened the discussion on

Rheumatoid Arthritis.

He submitted that it was generally felt that the disease, if not entirely due to some form of infection, was, at any rate, chiefly due to it. Was, however, infection the sole cause? Might, for instance, disordered metabolism initiate the changes that occurred in the joints? Such an authority as Sir A. Garrod had expressed the belief that the infective factor had been over-emphasised, and it was necessary to ask whether we were justified in ascribing the arthritis in all cases to infection. Reviewing other possible causative factors, he did not believe that heredity disposition was of much importance. Errors in carbohydrate metabolism had been thought to have a place in the causation of the disease, and it had been reported that 20 per cent. of cases showed a lowered basal metabolism and a diminished sugar-tolerance; these findings, however, probably represented effects rather than causes of the disease, and it had been found that after removal of a septic focus the sugar-tolerance returned to normal; moreover, diabetes mellitus was not commonly associated with rheumatoid arthritis. Similarly chronic infection was more probably the cause of thyroid insufficiency and other endocrine disturbances than vice versa, and on the whole there was not much evidence that such metabolic disturbances stood in causal relationship to the disease.

Speaking of the source of infection, Sir Humphry Rolleston said that in one series the teeth and gums had been found in 90 per cent. of cases to be the main source; in another series the tonsils were infected in 75 per cent. Accessory nasal sinusitis, he thought, might be secondary to dental infection. Two varieties of dental infection had to be distinguished. First, pyorrhoea alveolaris, where the infection was open and probably had not much causal effect in arthritis apart from achlorhydria; secondly, dental apical abscesses, from which absorption into the blood-stream was direct. In the former mode of infection it was possible that perversion of the functions of the liver, which stood between the alimentary canal and the

systemic circulation, might be a contributory cause of the disease; in such cases also the small rather than the large intestine appeared to act as a source of infection. In the genito-urinary tract the *B. coli* might act as an infective agent in a few cases, especially when harboured in the prostate. The respiratory tract, apart from cases of pulmonary arthropathy, could for practical purposes be exonerated. Although the opinion held in France that some cases of rheumatoid arthritis might be due to the toxins of the tubercle bacillus found little or no support in England, yet it was worth bearing in mind a possible analogy between syphilis and parasyphilitic disease on the one hand and tuberculosis and rheumatoid arthritis on the other. He referred also to the occasional association of arthritis with psoriasis and impetigo, and suggested that an anaphylactic relationship might exist between them. The chief objections to the infective theory were that people often have infective foci but no arthritis, and that in many cases we can find no infective focus. The uncertain factor of the soil, however, was to be borne in mind in weighing such objections, and search for a possible focus—e.g., in the prostate or nasal sinuses—was often incomplete. Again, certain foci of infection might be "closed"—the gall-bladder, for example—or one joint might act as a reservoir of infection for other joints. From the bacteriological standpoint it was usually a streptococcus that was incriminated, but there was often difficulty in recovering the organism from the synovial fluid and membranes.

As to treatment, prevention was the keynote. Eradication of infection, as, for instance, in dental extraction, must be complete. Just as a match was as effective as a torch in firing a train of gunpowder, so a small focus of infection might set up an arthritis as severe as a large one. Dead teeth were a favourite seat for infecting organisms, and there was consequently a danger in killing the nerves of teeth. As to encouraging the soil, he referred to the possibility of stimulating metabolism by thyroid extract, parathyroid, arsenic, iodine, and heliotherapy, and he drew attention to the theoretical uses of protein shock in therapy.

Mr. W. R. Ackland considered the division of dental sepsis into pyorrhœa and dental abscesses too hard and fast. Apical abscesses sometimes discharged through the gum, while in pyorrhœa, on the other hand the deeper layers could never be properly drained. Gastric juice did not always destroy the streptococcus and it might even liberate an endotoxin. Moreover, there was no gastric juice in the stomach at night, when toxins might pour down into the stomach and ultimately produce achlorhydria, and if the liver functions were affected the infection would pass to the general circulation. The streptococcus appeared to have an especial affinity for a dead tooth. The results of treatment were, on the whole, disappointing. One might at least hope, however, that patients would not get worse thereafter. X rays of the teeth not being infallible, he was in the habit of condemning all bridges, crowns, and dead teeth.

Dr. Rupert Waterhouse, from a hydrotherapeutic standpoint, said that though the infective hypothesis of rheumatoid arthritis was in full swing in Bath 25 years ago, there yet seemed as a result to be no diminution in the number of patients seeking relief there. Since the war especially, and in contrast to gout, the disease had increased. Not more than 10 per cent. of the cases recovered; but it was something from a patient's point of view to obtain even a slight functional improvement. The ideal was to get the patient to take intermittent courses of treatment, lasting not longer than six to eight weeks; longer courses were undesirable as promoting debility.

Prof. Osgood (Harvard University) feared that it must be confessed that in most cases removal of infected foci did not lead to recovery; in one series, indeed, there had been more recoveries where the foci had not been removed. There might, he suggested, be a missing link between a disordered metabolism

and an infection. As a result of the presence of toxins often specific in man (and, indeed, often possessing a strict tissue-specificity), the permeability of the perisynovial capillaries might be modified, and a lowering of the basal metabolism induced—a matter of sensitisation.

Sir Robert Jones emphasised the disease as being a conjoint problem for the physician and surgeon. When the surgeon was called in it was usually too late for him to prevent crippling deformities. The natural course of the disease was towards deformity, which it lay in the power of any general practitioner to prevent. The first physical sign of deformity was a spasm of muscles to obtain the position of ease. As a rule the flexors pulled more and more effectively than the extensors, and so deformity of the muscles resulted. Of two types, one proliferative and the other osteophytic, the former was the more difficult to treat owing to the greater pain. He then referred to special joints; in the wrist, for instance, palmar flexion and ulnar deviation might be countered by an appropriate dorsi-flexion splint; flexion of the knees and adduction of the hips could be prevented by posture, sand-bags, and gentle weight extension. Any movements given were only to be within the limits of pain, and the greatest care was to be taken not to permit rash movements, such as, for instance, forcible extension of a knee where posterior displacement of the tibia was present in addition to flexion. Open operation was often of great avail, even in advanced cases; masses could be removed from the joints or arthrodesis performed with very satisfactory results.

Prof. Cawadias (Athens), after referring to the great variability of the factor of resistance of the body to infection, suggested that disordered metabolism of sulphur might contribute to this aspect of the disease. In support of this hypothesis he advanced the following observations: (1) Cases of rheumatoid arthritis lost too much sulphur in the urine. (2) This imperfectly oxidised sulphur pointed to a general defect in oxidation. (3) The fact that there was no increase in the output of ethereal sulphates showed that the increased sulphur did not originate from mere destruction of cartilage.

Dr. J. M. H. Monro reviewed several series of cases, showing that changes in the blood—anæmia, leucopenia, leucocytosis, and complement-fixation—might be found, in contrast to normal blood, in about 80 per cent. of cases of rheumatoid arthritis. The *Streptococcus viridans* appeared to be the usual source of infection, and had been found in the roots of teeth in which the X ray findings had been negative. While cocci were the usual cause of infection, it was not uncommon to find coincident tuberculosis and even syphilis.

Mr. Timbrell Fisher, speaking from a pathological standpoint, proposed to substitute for the older nomenclature of rheumatoid and osteo-arthritis a division of cases into three groups of chronic arthritis: (1) Chondro-osteal type, in which there was a primary degeneration of the more central cartilage, with eburnation of the underlying bone, while the lateral part of the cartilage became hypertrophied. It was only later that the synovial membranes also became hypertrophied, and there was never any small round cell infiltration. These cases, occurring usually in later life, constituted a degenerative group. (2) Mixed type, in which the cartilaginous and synovial changes occurred concurrently. A pannus spread from the synovial membrane into the cartilage, and small round cells were present. Lipping only occurred later. (3) Synovial type, which appeared more inflammatory, with abundant infiltration of small round cells.

Sir W. Willcox regarded infection as the primary cause in the great majority of cases, but was careful to exclude gout, neuropathic joint lesions, and such a condition as intermittent hydrarthrosis from the group under discussion. In support of the infective hypothesis he brought forward the following considerations: (1) Other known organisms—e.g., gonococcus,

pneumococcus, and *B. typhosus*—might produce arthritis very similar to rheumatoid arthritis; (2) rheumatoid arthritis frequently followed parturition; (3) an infective focus was almost always discoverable. Dental sepsis accounted for most cases (72 per cent.); the apical infections were not true abscesses causing pain from pressure, but rather necrotic areas. Tonsillar cases were fewer (10 per cent.) and occurred in younger patients especially. Diagnosis of antral infections was often difficult, even with radiography and transillumination, and in such cases it was best to puncture the antrum. The colon was often the seat of infection in elderly patients. Tuberculosis elsewhere was not, in his opinion, an important aetiological factor; on the other hand, he thought that the presence of septic foci predisposed to the development of phthisis. (4) The eradication of the infective focus had usually been followed by cessation of active inflammation. (5) Rheumatoid arthritis was only a manifestation in the joints of a chronic toxæmia. Treatment should aim at the removal of the infective cause, and might include Plombières colon irrigation as an important factor. Only after this removal were vaccines to be employed, and then only in small doses.

Sir J. Barr expressed his belief that acid fermentation in a dilated stomach was the main cause of the disease, and advocated a diet rich in red meat and poor in carbohydrate.

Lord Dawson said that it was an irresistible conclusion that infection played a part. The difficulty lay in the origin and measure of that infection, and hence a speculative removal of teeth and tonsils might be advised. Sometimes the source of infection might be inaccessible; at other times the infection might well be one which under ordinary conditions would have been non-pathogenic. In such cases treatment must be concerned with the raising of resistance. He looked to the bio-chemist to explain the expression "resistance," with the coöperation of the bedside physician. If the results of dental extraction were disappointing, and if it must be admitted that this was an operation of some violence, especially in the aged, yet there was a compensatory satisfaction in observing the increased care which the rising generation was giving to its teeth, even in hospital practice, as a result, he presumed, of its observations of its seniors.

Sir H. Rolleston replied. He referred to the sensitisation hypothesis of Prof. Osgood and to the observations of Prof. Cawadias on sulphur. He had always imagined that sulphur was given as an internal antiseptic. With regard to Lord Dawson's conclusion, he would put the question finally in another way: "Can you," he asked, "have rheumatoid arthritis without infection?"

THURSDAY, JULY 23RD.

Hyperpiesia.

Prof. T. R. Elliott having taken the chair, Lord Dawson opened a discussion on hyperpiesia. With a view to the necessity of confining his remarks to certain aspects of hyperpiesia, he postulated the assumption that this was a disease *sui generis*, involving certain disabilities, of which cardiac and vascular disease was the gravest. But it was better, he considered, in this inquiry not to examine those cases which showed most evidence of cardiovascular wear and tear, but rather to approach the subject through the avenue of youth, thus excluding those graver secondary complications; for it was in later life that hyperpiesia and arterio-sclerosis hunted in couples, and only by excluding the latter might they hope to determine whether hyperpiesia had its beginnings in structural change or in faulty function. The systolic blood pressure reached between the ages of 20 and 45 years the figure of from 115 to 130 mm. Hg; during this period it did not vary much, and he would from his observations view with uneasiness, at that period of life, a fixed systolic pressure of over 140. With exercise, of course, there was a rise, but in health a

subsequent fall to normal took place within a few moments of resumption of rest. The studies of Alvarez had shown that of 1500 youths at the University of California 20 per cent. had pressures of over 140. No doubt there was a passing psychological cause for some of these, but it remained a fact that a certain proportion of the young had a true rise of systolic pressure. The diastolic pressure had been less widely studied, but he suggested that at this time of life it lay normally between 75 and 80 mm. Hg, and that at any age a figure of above 100 should be viewed with uneasiness.

Lord Dawson next referred to two families, each of two generations, in one of which no member had a systolic blood pressure of above 110, while in the other no member had a pressure of below 130. These examples prompted two reflections: (a) That vaso-constriction played a very varying part in different individuals; and (b) that hyperpiesia began as an exaggeration of a quality—in other words, that it began in the realm of physiology to end in that of pathology.

A special investigation had been made in 650 school-children between the ages of 10 and 17, and 52 of these, or 8 per cent., had shown a systolic pressure of over 130 mm. Hg. The observations had been multiplied to exclude factors of excitement, and it had not been found possible to identify hyperpiesia with any particular type of child. Prospects of a school examination did not raise the pressure; on the other hand, the classes for the Oxford Senior Local Examinations, attracting as they did ambitious children, in whom they might be supposed to engender some anxiety as to their prospects in life, showed a relatively high incidence of hyperpiesia in the children attending them. He believed that in these cases the high blood pressure was an expression of a type of mind which was naturally striving and ambitious. In this group of 8 per cent. one could fairly rule out any degenerative structural process; it was more likely that these cases showed an inborn peculiarity of function, which might become so accentuated as to produce damage in varying degree. Correction might be effected by choice of suitable careers; otherwise vaso-constriction, progressively provoked by slighter and slighter stimuli, might cause a condition of high pressure to become more or less permanent.

A more detailed investigation of nine cases selected from the same group had elicited more definite support of this view; these were all boys, and showed in most cases, in addition to the raised systolic pressure, palpable radial arteries and accentuated aortic second sounds; in four, moreover, there was hypertrophy of the left ventricle, and in three a blood-urea of over 0.050 per cent. One case had a urea concentration of under 1.5 per cent. As would be expected, there was considerable variation among these cases; they merged on the one hand with a physiological, and on the other with a pathological state, those showing the most definite cardiac hypertrophy being those subjected to the greatest strain. Pathological evidence was, of course, not easily forthcoming; but in one exceptional case of a girl, often showing a pressure of 240 mm. Hg systolic and 140 diastolic at the age of 19, it had been possible during an operation for decapsulation of the kidneys to secure portions of the organs for examination. Lord Dawson showed these sections on the epidiascope. They illustrated (1) marked hypertrophy of the tunica media of the larger arteries; (2) slight fatty degeneration of the intima of the smaller arteries; and (3) patches of partial atrophy of the tubules due to small round cell infiltration.

In later life high blood pressure might supervene upon a normal pressure in youth, and here it was necessary to consider, in addition to family or individual predisposition, the possible effects of chemical agencies, of pressor substances (such as guanidine derivatives), and of the products of erroneous metabolism. But in his view hyperpiesia had its chief origin as a habit of body and mind,

and crept into life without subjective symptoms: so that unless it were disclosed by a fortunate medical examination it might latently lead to actual structural disease.

Prof. E. H. Starling emphasised the extreme importance of the blood-supply to the vaso-motor centre in the medulla. This centre did not control its own blood-supply by vaso-motor fibres, but did so indirectly by controlling the pressure elsewhere. A raising of the blood pressure in the circle of Willis was compensated for by a lowering of the pressure elsewhere, and vice versa. This condition was demonstrated by an illustration of an experiment, in which it was shown that if the intracranial contents of a dog were cut off from the heart and connected with the heart of another dog, any variation which might be produced in the blood pressure in the cranial arteries was compensated for by an opposite change in the blood pressure in the other parts of the body, this change taking place at similar rate to that of the variation of the cranial blood pressure. The chief factors involved in maintaining blood pressure were: (1) The output of the heart, which was proportional to the flow into the heart; and (2) the peripheral resistance, which was under the control of the vaso-motor centre, and was chiefly regulated in the splanchnic area. Thus in man the pressure was maintained at 85 to 130 mm. Hg. But, he asked, what determined the average height? The answer was that the blood pressure was determined by the blood-supply that was necessary for the brain; thus even in heart failure the pressure must not fall, since at all costs the blood-supply to the medulla must be maintained.

In hyperpiesia the pressure was set at a higher level, and any oscillation took place around it. He submitted that the change in the level had to be effected and maintained because otherwise the vaso-motor centre would not receive an adequate amount of blood for its needs. Pursuing this line of thought, they might inquire what were the conditions under which the vaso-motor centre would, without a rise of blood pressure, obtain an insufficient blood-supply. These might be (1) gross changes in the vessels; (2) claudication; and (3) arterial spasm; but, more important than these, seemed to be (4) changes in the capillary walls—i.e., alterations in size and in permeability. If from such causes the pressure in the peri-capillary lymphatics were raised (a condition possibly present in uræmia and the toxæmias of pregnancy, and in the condition he referred to as "wet-brain," accompanied by transient paralyses) this peripheral pressure would explain the rise of general blood pressure necessary to overcome it. There was no evidence that a diseased kidney was directly responsible for the raised blood pressure. Cohnheim, indeed, regarded a rise of pressure in renal disease as compensatory; but even so the stimulus could only act through the vaso-motor centre. In conclusion, he submitted that in investigating any possible prime cause of hyperpiesia, it should always first be asked how that cause could modify the blood-supply to the vaso-motor centre in the medulla.

Dr. McCrae (Philadelphia) expressed his feeling that the most obvious things about blood-tension were the difficulties it presented. In certain cases of childhood a raised pressure appeared a temporary condition, in others it persisted; possible causes were organic disease and infections, early renal changes, and, in the case of hypo-pituitarism and the menopause endocrine influences. He wished particularly to emphasise the fact that here for the general practitioner was an opportunity for clinical research over a length of time such as hospital and consulting practice did not offer.

Dr. Batty Shaw said that he believed the main origin of hyperpiesia was toxic. The vaso-motor centre was not the only site of nervous control of the vessels; there was also the neuro-muscular plate, and he submitted that this point of junction might

be affected by chemical agents. What were the toxic agents? Not, he thought, infective poisons which were depressor in their action, but such pressor substances as were derived from the suprarenal, the pituitary, and the renal cortex. He stressed the importance of recording the daily blood pressure as regularly as the pulse and temperature, and reported a case of hyperpietic crisis in which the pressure had suddenly dropped from 230 to 130 with accompanying coma and high blood-urea, and almost as quickly returned to the original level. He ascribed such changes to physiologically antagonistic toxins.

Dr. Otto May, speaking as medical officer to the Prudential Assurance Co., Ltd., while admitting that many sources of error arose in estimating the blood pressure of an individual, held that, where statistical calculations depended upon a very large number of cases, the individual fallacies became of relatively little importance. Such statistics showed that an increased systolic pressure was a definite menace to longevity; with pressures over 170 the outlook got rapidly worse, while at 200 and over the mortality was eight times the normal. He referred with regret to the relatively slight use made by medical men of the sphygmomanometer as compared with the stethoscope. He made his opinion quite clear that statistical information, even of the clearest kind, was not to be applied in individual cases without due consideration of other factors in the physical condition.

Dr. Geoffrey Evans, after reference to early researches which had not confirmed anatomical changes expected in cases dead with hyperpiesia, remarked that in the natural experiment of chronic interstitial nephritis they were now able to observe that hypertension and vascular disease were not necessary accompaniments of renal disease. He believed in the toxic origin of hyperpiesia, but was more concerned with the condition itself. Hyperpiesia was a clinical state quite independent of the kidneys; as Sir Clifford Allbutt had said, it did not end in nephritis—its evolution was rather towards heart disease and hæmorrhage. Its hall-mark was cardiac hypertrophy, as demonstrated by X rays and the electro-cardiograph. Retinal vascular changes and modifications of the aortic second sound were other characteristics of it. The morbid anatomy was quite definite, as compared, for instance, with that of a case of migraine. In hyperpiesia the body was plethoric, the heart large, and there was a definite hypertrophy of the arterial walls best seen on macroscopic section of the otherwise normal spleen and kidneys. Microscopically, the intima appeared swollen with endothelial cell-proliferation, which, being avascular, went on to fatty degeneration of the intima. The tunica media might or might not be hypertrophied, or the hypertrophy might be apparent only.

Dr. F. H. Humphris referred to benefits in hyperpiesia from electrical treatment; he maintained that every application produced a lowering of the maximal arterial pressure by 10 per cent.

Dr. W. Salisbury-Sharpe, from a study of 500 men of between the ages of 60 and 65, had found that a considerable degree of activity was compatible with high blood pressure.

Dr. A. Cawadias regarded hyperpiesia as a syndrome. Two diagnoses were necessary: (1) Diagnosis of the syndrome itself; here it must be recognised that there were local hyperpieses giving rise to crises—e.g., in the lower limbs and the heart. (2) Diagnosis of the cause. The influences which might act upon the vaso-motor centre were: (a) toxic—as in nephritis; (b) chemical—e.g., adrenalin; and (c) nervous. He considered the investigation of youth to be the best avenue of research.

Dr. Stacey Wilson referred to varying differences between estimations of the blood pressure made by different methods—e.g., tactile and auscultatory. He regarded these peculiarities as worthy of investigation by general practitioners. In one case the auscultatory method gave the higher reading, in

another the tactile. Why was this? He was sure that toxic conditions were important: syphilis alone was evidence enough of this.

Prof. R. J. S. McDowall believed that in emotional and toxic states there was a condition of strain, as a result of which a functional overaction took place. He would cut down the protein of the diet in hyperpiesia.

Lord Dawson, in replying, said it was difficult to believe that hyperpiesia in children was toxic; an innate tendency in them seemed much more probable. Anxiety, and especially repressed anxiety, might raise the pressure and possibly there was a metabolic factor. But the border-line between functional error and morbid entity seemed to him, in this case at any rate, to be a blurred one.

FRIDAY, JULY 24TH.

The Uses and Abuses of Endocrine Therapy.

In opening the discussion on this subject, Lord Dawson being in the chair, Dr. W. Langdon Brown said that he would deal with the uses of endocrine therapy, leaving Prof. Swale Vincent to deal with the abuses. An endocrine preparation might be used either to replace a deficient internal secretion (thyroid, insulin) or for its pharmacological action (adrenalin). But before it could be used on a rational basis it must be shown that the gland in question forms an internal secretion; that its active principles can be extracted; and that the extract can be so administered as to admit of its utilisation by the body. In very few instances had all these criteria been satisfied, so that clinicians had been forced into more empirical methods. Empiricism had won success in other spheres—e.g., quinine, salicylates, and, previous to the discovery of vitamins, cod-liver oil—and moreover the functions of the thyroid itself had been made out at the bedside. Nevertheless, the empirical method was to be used critically, and the study of the basal metabolic-rate and of the blood-sugar curve had recently been useful in confirming the effects of extracts: of more limited use at present was the estimation of the calcium of the blood.

Thyroid extract fulfilled all the above criteria; its principle was a general quickener of metabolism. A total daily dose of 6 gr. of the extract of the fresh gland (which was one-fifth as strong as that of the desiccated gland) needed seldom to be exceeded. It was worth using in children suffering from stunted growth, nocturnal enuresis, night-terrors, and relaxation of ligaments—e.g., knock-knee, flat-foot, and lordosis—as well as in cases presenting the stigmata of hypothyroidism; it was the great stimulant to growth. Where growth was complete, thyroid was an agent katabolic of those products of incomplete combustion which, in conditions of thyroid deficiency, infiltrated many of the tissues.

The use of *parathyroid* extract was more justifiable now that Collip had isolated its active principle. Its uses were: (1) Sedative to the nervous tissues (e.g., in tetany, petit-mal, and eclampsia) by effecting a rise in the blood calcium, and (2) to promote healing in chronic sepsis (chronic gastric ulcer, varicose ulcer). It was absorbed when given by the mouth. There was a mass of evidence pointing to *adrenalin* as a general sympathetic stimulant to be used in such emergencies as acute asthma, vaso-motor paralysis, heart failure, and hypoglycemia, but it was of little or no use for substitution therapy in Addison's disease. Extracts of the anterior lobe of the *pituitary* certainly appeared to have given results, when administered orally, in cases of deficient growth from pituitary insufficiency. As to the posterior lobe, he believed that its secretion, *pituitrin*, had an important association with the reproductive processes, in support of which belief he mentioned among others the following observations: (1) Fröhlich's syndrome was always associated with undeveloped sexual organs. (2) Dixon and Marshall had shown that a corpus luteum in the ovary in pregnancy could completely inhibit the action

of ovarian extract which normally, on injection, caused an immediate flow of *pituitrin* into the cerebro-spinal fluid. Just before parturition, however, the ovarian extract would again, on injection, profoundly stimulate the production of *pituitrin*, leading to uterine contractions and lactation. Similarly, he had found clinically that an extract of corpus luteum soon stopped excessive lactation in a woman who had an enlarged pituitary fossa. Diabetes insipidus, believed to be associated with posterior lobe deficiency, had been treated with some success by spraying extracts of pituitary into the nose.

Speaking of *pancreatic* extracts, there could be no doubt of the efficacy of insulin and there were considerable numbers of patients who, having had a course of insulin, had later been able to give it up and yet to keep free of glycosuria. Dr. Langdon Brown protested strongly against statements which led patients to deprive themselves of this most valuable remedy of diabetes. Insulin had also been used tentatively for hyperthyroidism, and it should be used in the acute hyperthyroidism following operations on the thyroid gland. It could reduce the basal metabolic rate. It might be hoped that *ovarian* extracts, recently shown by Allen and Doisy to produce definite effects, might, if they could be freed from corpus luteum, benefit ovarian inadequacy, especially in the miseries of the climacteric in woman. He was sceptical as to the value of other endocrine extracts, though in the case of the testis the grafting method offered a chance of effective treatment.

Prof. Swale Vincent said that there should be no essential difference between the nature of observations made by laboratory workers and clinical workers. It was the duty of the latter, as of the former, to carry out an experiment if an opportunity presented itself. The difficulty for him appeared to lie in making satisfactory, or indeed any, criteria to justify the term "experiment." It was, for instance, useless to claim that a drug had done good, unless they had a moderately clear idea of what would have happened if the drug had not been used; yet this obvious consideration had been universally overlooked even by medical men, and the public had not even begun to be suspicious of the resulting and blatant advertisement of the drug vendor. Again, he contended that the information derived from the observation of the effects of juices squeezed out of certain organs did not justify at all the assumption that the physiological action of those organs was the same as the pharmacological action of their extracts. If this were so the extirpation of the organs should produce effects exactly opposite to the effects of injecting the extracts. This did not occur. For instance, extirpation of the adrenal glands did not cause an immediate fall in blood pressure. Similarly, to prove that *pituitrin* was the internal secretion of the pituitary, it was not enough to obtain it by extraction from the gland.

If this erroneous type of conclusion were accepted—that the pharmacological effect of an extract justified the assumption of a similar physiological effect of the gland from which it was obtained—what were they to say about the other ductless glands and tissues? All tissue extracts in general (other than those of the adrenals and pituitary) had the effect of lowering the blood pressure, and by this argument it was rational to supply every month a new substitution product or hormone for lowering the blood pressure, derived from each tissue whose extract had been examined. In France it had been argued that each tissue produced its own substance for lowering its own local blood pressure. It could not be urged too strongly that the effects of these extracts were not specific and had nothing to do with any internal secretion on the part of the tissue in question. To argue that because extracts of the cerebral cortex lowered the blood pressure, it was therefore one of the functions of the cerebral cortex to manufacture and pour into the circulation a hormone, the duty of which was to keep down the blood pressure, would be absurd. Many physicians, however, had not claimed that their

endocrine practice was based on sound physiological data, but had insisted on the empirical value of endocrine extracts. While there was no objection to this attitude, it was only reasonable that the a posteriori evidence of relief or cure must be satisfactory. In many instances this was far from being the case, and the scientific value of conclusions drawn under such circumstances was nil.

His conclusions were that there were only two clear cases where they could employ a true substitution therapy—those of the thyroid and the pancreas; and only the thyroid was known to produce effects when given by the mouth. The cases, however, of the parathyroid and the ovary were perhaps in a transitional stage, and the preparation made by Allen and Doisy from the ovaries appeared to be active if injected hypodermically. Out of the long list of preparations of 42 organs and tissues advertised by the manufacturing druggists and prescribed by the "clinical endocrinologists," only one—the thyroid—was of proven value when given by the mouth.

Dr. Gardiner Hill spoke about work done by the St. Thomas's Hospital Medical Unit upon thyroid and pituitary therapy. (1) In obesity thyroid extract had been given by the mouth together with whole gland pituitary. Many of the cases were women at the menopause or just after parturition. Their sugar-tolerance curves differentiated two groups—namely, recent cases, in which there was a slowly decreasing sugar tolerance, and longer established cases, in which the sugar tolerance was high. In the latter group thyroid was useful. The more recent cases of the first group were some of them potential diabetics. Whole gland pituitary helped the sugar curve to fall. (2) In undergrown children feeding with extract of anterior lobe of pituitary was useful, and the rate of growth might be more than doubled by this means, which also increased the sugar tolerance in every case. Giving thyroid in addition produced an even greater effect, which could be to some extent checked by estimation of the basal metabolism. Orchitic and ovarian extracts had been found quite ineffective in cases of amenorrhoea.

Mr. Kenneth Walker spoke from the surgical aspect only, and formulated certain principles concerning living transplants. (1) The more nearly related the donor to the host, the more successful the effects; grafts from another species from that of the host were rapidly absorbed owing to the development of fibrous tissue in the graft and leucocytic invasion from the host. (2) Different tissues disappeared with different rapidity—e.g., the medulla of the adrenal quickly disappeared while the cortex might survive. (3) In transplantation experiments it was possible to feminise male guinea-pigs only if they had been castrated, and to masculinise female guinea-pigs only after removing the ovaries. (4) A successful graft had to be calculated to supply a deficiency; any excess of material transplanted was apparently physiologically inert. There was still much to be understood in the varying relations between the host cells and the transplant.

Dr. H. W. C. Vines described endocrine therapy as an undeveloped science. They were attempting to discuss it as though it was fully understood, and he strongly deprecated destructive criticism, whilst admitting the danger of enthusiasm. In such a science there was necessarily empiricism, but so also was there in vitamin and light therapy, and in treatment even by simple drugs like squill. He had recently obtained some evidence that the influence of parathyroids upon the blood-calcium was due to a protective colloid, which kept certain organic complexes of calcium and lecithin from precipitation. From experiments he had made in vitro it appeared probable that a quantitative relationship might be found between the amount of parathyroid substance used and the calcium content of experimental solutions. It was not surprising, therefore, that in tetany the oral administration of parathyroid was generally such a failure, while grafts or extracts injected might

cure the condition; for it was a question of the maintenance in the blood of a definite quantity of that protective substance. With regard to sprue, he pointed out four things: (1) Dr. Scott had had no success from the use of calcium salts. (2) He had had good results from using the "commercial" extracts of parathyroid with calcium salts. (3) The giving of thyroid invariably caused a relapse. (4) Scott's work had been confirmed by the work of other observers.

Prof. F. Langmead said that while Dr. Langdon Brown had emphasised the value of trial in endocrine therapy, many of the trials were not real tests at all, comprising too often the use of substances they had no knowledge of, in strengths which were quite uncertain, for treating diseases which were not understood. The value of thyroid medication in cretins was, of course, indubitable. He had also seen good results in rheumatoid arthritis and in large goitres of puberty, but he thought it was of no value in enuresis. Referring to certain observations of Mr. Kenneth Walker, he stated that large quantities of the gland might be taken without any signs of overdose. He asked, referring to parathyroid, where it all came from? He thought much of the work on the blood-calcium to be worth little, owing to sources of error in the estimations. He did not believe that adrenalin when swallowed could reach the stomach in sufficient strength to be of use in gastrostaxis. He agreed that pituitary when given by the mouth had a pharmacological action by influencing the blood-sugar. Cases of "hypopituitarism" were a mixed lot, compared with true Fröhlich cases which were rare. The blood-sugar was the criterion of true hypopituitarism. Dr. Langdon Brown had only attempted to claim results for six glands, so that the long list of suggestions for organotherapy fully justified the cold douche of Prof. Swale Vincent.

Dr. Woods Hutchinson (U.S.A.) considered that only six or seven out of 72 American endocrine preparations were active. He referred to the great importance of sodium iodide in diminishing the frequency of goitre in the States.

Sir James Berry professed himself whole-heartedly in agreement with Prof. Swale Vincent. He particularly protested against statements made with regard to the use of parathyroid in tetany, which was not probably due to parathyroid deficiency at all; the laboratory work on this subject had impressed him unfavourably. He considered that the term hyperthyroidism was used too loosely; it was sometimes applied to people with enlarged thyroid glands who happened to have a rapid pulse. If anything, these people were *hypo*-thyroidic. He suggested the term *dysthyroidism* as useful; symptoms might be very mixed—e.g., myxedema with tachycardia. Iodine was good for early goitre of childhood, but too much of it might produce a true hyperthyroidism. Lack of iodine, however, was not the cause of endemic goitre any more than lack of quinine was the cause of malaria.

Dr. J. A. Nixon asked who it was that was creating the demand for the 72 inactive endocrine products, and would confess to doing so. The meeting would fortify the recipients of daily advertisements to resist them.

Dr. Langdon Brown, in replying, referred to a direct relationship existing between the basal metabolic rate and the pulse-pressure (excluding, of course, cases of aortic regurgitation). A pulse pressure of over 40 meant a basal metabolic rate above normal; this might be very useful in deciding whether cases of enlarged thyroid at puberty were hyper- or hypothyroidic. In many cases of tetany the calcium content of the blood was lowered, and the use of parathyroid, which raised the blood calcium, was justified.

Prof. Swale Vincent, replying, said that a certain measure of agreement between the two sides was beginning to appear. It was the advertising pamphlets and those medical men who wrote papers for them that required attacking.

JOINT MEETING OF THE SECTIONS OF
DISEASES OF CHILDREN AND OF
PUBLIC MEDICINE.

WEDNESDAY, JULY 22ND.

RHEUMATIC INFECTION IN CHILDHOOD.

THIS joint meeting was held under the Presidency of Dr. Robert Hutchison. Dr. F. J. Poynton (London), in introducing the subject, said there was no issue in practical medicine more important and more full of possibilities. Rheumatic heart disease was a frequent event under 12 years of age and a great cause of suffering and early death. In the young the heart had great recuperative powers if it was only rested and protected. There were many people with organic rheumatic heart disease living quiet useful lives and often doing more for the community than many a headstrong hale citizen who squandered his life in riotous living. Since chorea was so frequent among school-children in our large towns, there must surely be, he said, some discoverable factor straining the nervous system. He was not sanguine as to the eradication of this disease in the near future, but a great advance could be made by more careful organisation, greater supervision, and more widespread study. The first essential was to come to a decision as to what symptoms were good evidence of acute rheumatism. When the machinery was in better working order the inquiry could be extended to border-line cases. When county hospitals with facilities for prolonged rest, supervision, and education were established, it would be better to use them at first chiefly for children recovering from a first attack of rheumatic heart disease or from slight damage rather than for chronic cases. They would then be able to convince the public of the good achieved, and money would be forthcoming for the extension of the work. In the Hartfield Hospital in Sussex, established by the Children's Invalid Aid Association, for girls up to 15 and small boys, encouraging results had been obtained. Out of 123 rheumatic children admitted only two, after a period of much cold and rain in the first week in March, developed fever and rheumatic pains, whereas in London, during the same period from October, 1924, onwards, many cases of acute rheumatism, he said, were admitted to his hospital wards. The Hartfield Hospital was run on open-air lines, and although when it began its work the climatic conditions could not have been worse, the children gained remarkably in health and strength and their cardiac condition improved. Until we have a specific remedy for rheumatism, he said, the best we can do is to build up the body tissues. After puberty the tendency to cardiac rheumatism diminishes.

Further study would teach us what home surroundings were specially detrimental. We needed to know more about the modes of onset. The speaker's records of 1108 probable first attacks of acute rheumatism under 12 years of age showed 673 cases of carditis, 626 of arthritis, 617 of chorea, 344 of sore-throat, and 94 of nodules. One group of cases began with sore-throat, arthritis, and morbus cordis. A second group began with chorea, frequently accompanied by morbus cordis. A third, fortunately a small group, began with symptoms of great severity: fever, vomiting, diarrhoea, or sore-throat, followed by arthritis, carditis, nodules, rapid anæmia, and even chorea. Such fulminating attacks were most frequent in the younger children and in those with a strong family tendency to rheumatism. Such a first attack might prove fatal or leave the child terribly injured. A fourth group began with less acute though definite symptoms. These symptoms subsided, but left the child with fleeting pains, shortness of breath, and a tendency to develop the "rheumatic state." In such cases the first early dilatation of the heart was the key to the situation and was easily overlooked. In another group of cases one manifestation alone, such as chorea, was predominant. There were exceptions, but it was advisable to consider all cases of chorea

as of rheumatic origin. From the aspect of prevention Dr. Poynton attached great importance to chorea, which was so frequently associated with the most important of all cardiac lesions—namely, mitral stenosis. It also suggested nerve over-strain as a factor predisposing to acute rheumatism. He was convinced that a widespread inquiry into the subject of chorea by school medical officers would supply valuable information. Heart disease as a sole manifestation was even more important than chorea. The most frequent early heart lesion was dilatation, and the percussion of the deep cardiac dullness in childhood was a remarkably accurate method of investigation. Another group of cases began with sore-throat, enlarged cervical glands, fleeting pains, and dilatation of the heart, and this group was easily overlooked. Much had been written against laying undue stress upon cardiac murmurs, but a cardiac murmur in a child always needed consideration. With Dr. Paine the speaker had been responsible for establishing the doctrine of the local focus in rheumatic disease, and the modern doctrine of enucleation of the tonsils was founded on this theory. He believed that the time had come when we were justified in pressing upon the public the need for a concerted effort to protect our children from the effects of rheumatism.

Dr. Robert A. Askins (deputy M.O.H., Bristol) stated that the school medical department of Bristol had been for some years paying attention to this problem, and paid a tribute to the enthusiasm of Dr. Carey Coombs, of the Bristol General Hospital, and Dr. C. E. K. Herapath, of the Bristol Royal Infirmary, in investigating the clinical condition of a large number of their cases. Dr. Coombs had found that about two-thirds of the cases of rheumatic heart disease in Bristol began between the ages of 5 and 15. He estimated that probably between 12,000 and 20,000 deaths occurred annually in England and Wales from rheumatic heart disease contracted during the school age. Our knowledge of the cause of acute rheumatism was so limited that we were unable at present to suggest measures for its prevention. In his opinion the disease was due to an organism of low infectivity with a special condition, such as prolonged or massive dosage. There were in addition secondary factors. He thought that infection rather than heredity was the cause of the disease running in families. If they could not prevent, they could, however, aim at early ascertainment and diagnosis, early treatment and after-care, and training of the cases which were crippled. For early ascertainment the School Medical Service had the opportunities afforded by three medical examinations during school life, and the arrangement by which a child with symptoms could be medically examined at any time, at the instance of teachers and parents. In order to encourage the latter method a circular had been issued in Bristol couched in simple language on lines suggested by Dr. Poynton. For early treatment Dr. Askins favoured the cardiac clinic. Cases should be sent from the cardiac clinic to an open-air country hospital school. When the patient returned from the hospital, training for a suitable occupation should be provided in a branch of a school for cripples. Throughout each stage the child should be under the supervision of medical experts who had special skill in cardiology. He believed a satisfactory scheme could be provided at comparatively small cost. A few cardiac beds under the care of a specialist might be established at each country cripples' hospital. All this work should be carried out by joint action between the clinician and the department of the medical officer of health and be linked up with the work of the voluntary hospitals and of the private practitioner. There was great need for research and the State must help.

Dr. Carey Coombs welcomed alliance between the clinician and the administrator. In order to secure early diagnosis many doubtful cases would have to come under review. Biochemical reactions were of no assistance as yet. They had only physical signs

to rely upon. Hospitals must in future supply both open-air and occupation like the Forbes-Fraser Hospital in Bath.

Dr. Reginald Miller referred to the B.M.A. Committee appointed as the result of the discussion at the Portsmouth meeting. Its report was expected shortly and should prove a valuable document for determining the lines of investigation. He also referred to two groups of early rheumatic children, one being composed of highly nervous children, and the other group, with symptoms such as anæmia, night cough and tonsillitis, were frequently mistaken for early tubercle. The Public Health Service must settle the connexion between poverty and rheumatism. Choreic symptoms were not always rheumatic.

Dr. J. A. Glover (Ministry of Health) spoke as to the effect of damp and overcrowded buildings. He also referred to the American idea of moving rheumatic patients to a less rheumatic place. He would like to see the experiment of compulsory notification for five years in two areas with a varying incidence of the disease with a thorough investigation and a mobile research unit attached to each. Lancashire with Manchester as a research centre would be one suitable area.

Dr. Vincent Coates drew attention to a type of small subcutaneous fibroid nodule occurring chiefly along the ulnar border and over the spinous processes, which he had found to be a valuable early sign of rheumatism among the school-children in Bath. (At the close of discussion Dr. Coates demonstrated the presence of these small nodules on a patient (v. p. 326).)

Dr. R. E. Thomas said that it took him three months to learn to palpate the small nodules described by Dr. Coates, but he now relied upon them as a very valuable sign. He did not think these rheumatic affections were associated with poverty but rather with harassed parents. He thought they were more frequent in low-lying districts. They were a common cause of long absence from school, and accounted for 20 per cent. of such absence in London in 1922. (v. p. 326.)

Dr. A. P. Thomson (Birmingham) drew attention to the value of failure in writing as an early sign. The ordinary larger nodules were very rare in Birmingham, and he would be interested to see if Dr. Coates's smaller nodules were equally rare. He thought that the type of rheumatism and the predominant signs varied in different districts. The low-lying sites in Birmingham, near the so-called rivers, seemed to favour the prevalence of rheumatism. He thought house dampness was important and familial prevalence unimportant. It did not appear to be associated with neglected children. There was a hospital for 50 rheumatic children in Birmingham in which the duration of in-patient treatment was long, over six months. Their results from removal of tonsils were encouraging. Out of 70 cases treated only one had persistent valvular disease. Removal of the tonsils seemed to protect against cardiac trouble, but not against rheumatism. He thought the cardiac cases, and especially cases of chorea, should be kept out of general hospitals for cripples. There was no need for special cardiac clinics. Of 60 cases discharged from the Birmingham Hospital 35 had led normal lives for over a year.

Dr. T. Eustace Hill (M.O.H., co. Durham) thought cardiac clinics might be necessary in county areas. He welcomed coöperation with the clinicians.

Dr. Noy Scott (Devon) thought compulsory school attendance in all weathers and damp clothes had a bad effect in rural areas. He also drew attention to the ineffectiveness of modern damp-proof courses, even those sanctioned by the Ministry, and to the harm done by building on unsuitable sites.

Dr. F. E. Wynne (M.O.H., Sheffield) described the constitution of the Sheffield Medical Advisory Committee, which had instituted inquiries with regard to encephalitis lethargica and mammary cancer and intended to take the question of rheumatism in childhood as its third subject for inquiry. He believed

that the large amount of routine work in the School Medical Service stood in the way of special inquiries such as they were discussing.

The Chairman emphasised the gravity of the problem and the need for early diagnosis. He hoped for good results from Dr. Coates's new sign. He distrusted the specialists and believed that the medical man with all-round experience was superior to the cardiologist. The financial side was important, as this was now a poor country. Their ignorance of ætiology was the crux of the question. He believed that chorea was associated with the mental strain at school. In his experience rheumatism was not a slum disease, but rather associated with hard-working, successful artisan families.

Reply.

Dr. Poynton, in his reply, hoped for a chief centre of research in London. He agreed that these diseases were not associated with the lowest poverty, but with the artisan class and anxious parents. His reason for objecting to the pressing of salicylates was that he found them bad for the rheumatic nervous child. He did not dispute their value for adult arthritis and for the relief of pain, but for cardiac cases in children he preferred the ethyl ester of para-methyl cinchonic acid.—Dr. Askins, in replying, expressed himself strongly in favour of cardiac clinics after his four years' experience in Bristol. They needed experts with great experience of heart cases to deal with these children satisfactorily.

SECTION OF PUBLIC MEDICINE.

THURSDAY, JULY 23RD.

FOOD MANIPULATION IN RELATION TO HEALTH.

A discussion on this subject was held under the presidency of Dr. T. E. Hill. Dr. William G. Savage, in the opening paper, said we could conveniently divide the effects of food manipulation into three groups, according to whether (i.) it affected the nutritive value of the food, or (ii.) produced bacterial or parasitic infections, or (iii.) resulted in chemical contamination. As regards (i.) he wished to protest against the views expressed by extremists. For example, he was much impressed with the importance of vitamins in our dietary, but he did not believe in advocating vitamins on grounds which we could not substantiate. As regards bacterial contamination of food, while dust or air-borne sources may be considerable, pathogenic bacilli were far more likely to be added from direct human handling. Great importance should be attached to the use of food which is sound initially. For example, *Bacillus botulinus* would find a suitable nidus for multiplication on or within damaged fruit and might produce a considerable amount of toxin. The danger of the survival of spores or even of toxin after heat-treatment was greatly increased by the use of damaged fruit or other food. It was important to classify the risks to health from manipulated food. Manipulated foods could be grouped according to the danger inherent in each different sort. In the first group came foods which were non-multiplying media for bacteria, and which were only eaten when cooked, such as ordinary cereals, rice, oatmeal, &c. In the next least dangerous group were non-multiplying media which were not subsequently cooked, such as bread. A third group contained foods which were multiplying media for bacteria, which were not subject to slow cooling, and which were subsequently cooked. Sausages were a good example. Sausages often contained numerous living bacilli and, being frequently only lightly cooked, a good many of the bacilli might survive. Sausages therefore should be well cooked, especially the German types of sausages containing blood, for these were more liable to harbour pathogenic organisms. In the fourth group came food which was a multiplying medium, was heated in its preparation, and subsequently cooled slowly, and then eaten without further cooking. If a food-poisoning bacillus gained

access to such food when cooling, the temperature conditions favoured rapid multiplication. Many outbreaks of food poisoning had originated from this group, which included brawn, potted meats, and meat pies. In the most dangerous group were foods similar to the latter type, but containing viscera, and since pathogenic bacilli were more likely to be present in livers, lungs, and intestines, their preparation required special care. Fortunately these types of food were not greatly favoured in this country.

The following table showed the kind of food incriminated in 203 outbreaks of food poisoning in the British Isles, many of which were investigated by Mr. Bruce White, pathologist to the Home Office, and himself.

	Number and percentage.		Number and percentage.
Canned meat	.. 31	Manipulated meat	10 (4.9)
" marine products	.. 27 (30.5)	Fresh meat	.. 33 (16.3)
fruit	.. 4	Fruit and vegetables (not canned)	.. 8 (3.9)
Milk	.. 14 (6.9)	Other foods	.. 6 (2.9)
Milk products	.. 16 (7.9)		
Made-up meat	.. 54 (26.6)		

As regards chemical contaminations, all preservatives except those scheduled as permissible should be prohibited, and the use of all permissible preservatives should be adequately declared on the label.

Dr. C. E. Goddard (M.O.H., Harrow-on-the-Hill) said it might be impossible to achieve perfect cleanliness, but it was incumbent on the public health service to prevent gross contamination. Imported food was a difficulty which might be dealt with by consular guarantees at the place of export. They had had recent revelations as to the conditions under which figs and sultanias were packed at Smyrna. He advocated the wrapping of bread. The M.O.H. had no power in the shops. He instanced the objectionable practice of customers pinching fruit, &c. Places where food is packed and made up should be licensed.

Dr. C. W. Cunningham said we needed more knowledge as to the effect of cold storage on the value of meat.

Dr. H. Scurfield agreed with Dr. Savage as to the tendency in some quarters to make exaggerated statements. He also deprecated the misleading loose general statements which were frequently made, even by those engaged in research work on this subject. He would like to see more work done to determine the vitamin content of such common foods as jam and marmalade. He thought there was plenty of evidence of something wrong with our dietary in the universal prevalence of dental decay and constipation and in last year's poor recruiting statistics. We were surely on safe grounds, he said, in advocating more milk and dairy products, more fresh fruit, and vegetables.—Dr. Noy Scott asked how it was that people could eat decomposed food in the form of game with impunity.

Dr. F. E. Wynne (Sheffield) said that the British Medical Association should insist upon the notification of cases of food poisoning. Opportunities for investigation were frequently lost by the failure of medical men to notify. He deprecated the use of much-advertised proprietary articles of food which were frequently extreme examples of food manipulation and the nutritive content of which was extremely expensive. It was unfortunate that such articles of food achieved such wide advertisement by their use at many infant welfare centres.

Dr. Hill said they were liable to "stunts" in public health, but that it was important to get what good they could from them. The wrapping of bread, for instance, might not be very important in itself, but was a good object-lesson. He hoped that the new regulations for preservatives would be issued unmodified.

Reply.

Dr. Savage, in reply, said there was no evidence that putrid food caused outbreaks of food poisoning. Such outbreaks were due to contamination with

specific bacteria. *Bacillus botulinus* was endemic in the soil of some parts of California, but with ordinary precautions of cleanliness and the use of sound food the danger was infinitesimal. The Loch Maree outbreak was the only one in this country which had been traced to *B. botulinus*.

THE INFLUENCE OF LIGHT ON HEALTH.

A discussion on the influence of sunlight and artificial lights on health was opened by Dr. Leonard Hill in an interesting and valuable paper indicating the present state of knowledge on the subject. At the outset he described the varying effects of rays according to their wave-length. Smoke pollution cut off the shorter rays. What with mist, cloud, smoke, glass windows, and clothes, city people got almost no exposure to ultra-violet rays during the winter, and while every effort should be made to prevent smoke pollution and to educate people to expose their skin to the sunlight, a great deal could be done by means of arc baths which should be installed not only in hospitals, but also in schools and public baths. A skilled attendant would be required, but arc baths were no more dangerous than a public swimming bath. Given a long-flame arc, taking 2½ to 3 kilo-watts, with white flame carbon poles, and a wire net screen a yard away from it, children could safely dance within one or two yards of the lamp for five minutes, nude save for a loin cloth. As acclimatisation came on and the skin browned the time could be lengthened to 10 or 15 minutes. Such baths once or twice a week would do much to maintain good health and prevent such diseases as rickets, tuberculosis, rheumatic fever, skin diseases, and catarrhs. If tungsten-cored carbons were used the ultra-violet intensity was greatly increased and the time of exposure could be reduced to a third or even less. Goggles must be worn to prevent conjunctivitis. A great many lamps were at present on the market and many were so weak in ultra-violet radiation as to be of little use. Some were quack instruments giving only violet light. Ultra-violet radiation had power to cure many resistant skin diseases such as ichthyosis, psoriasis, eczema, and boils, and marasmic and delicate children were improved by it, and mothers who could not nurse their babies might be made more efficient. Some observers reported good results from the combination of red light and ultra-violet rays. The action of ultra-violet rays was not interfered with by ordinary daylight, therefore one could have the arc lamps in light rooms with the windows open. Febrile cases should be treated by light with very great caution. The hospitals of the future should be bungalows with open-air wards, verandahs, and unroofed open-air courts, about which the beds could be run according to the weather. Girls wearing open-necked blouses and short skirts with artificial silk stockings secured more ultra-violet radiation. Men would do well to alter their dress and get rid of the close collar and long trousers. While exposure to the lower part of the leg to light and cool air was a preventive of varicose veins, over-exposure in cold winter weather might produce a chilblain-like erythema. Physiological knowledge as well as fashion should rule dress and prevent both over- and under-exposure. There was no evidence that radiation could endow an inactive food with the growth qualities pertaining to vitamin A. The reaction of the skin appeared to have the same curative effect, whether produced by the mercury vapour, the white flame carbon arc, the Tungsten arc, or the Tungsten filament incandescent lamp with quartz globe. One clinician preferred lamps weak in ultra-violet rays and strong in heating effect with long exposures five days a week. Another used lamps powerful in ultra-violet rays with short exposures once or twice a week; one liked to produce a mild erythema; another avoided erythema. One liked to produce pigmentation; another thought pigmenting should be avoided. The need of the moment was to standardise the lamps for treatment and to find out the most economical methods of exposure. Dosage could easily be measured by the

effect of ultra-violet radiation on the 30 per cent. acetone methylene-blue solution. Any loosely-woven garment let these rays through, but artificial silk fibre, being an acetyl-cellulose product, was more transparent than protein products, such as silk and wool fibres. If modesty required such material to be worn, longer exposures were needed. It had been stated that artificial sun treatment could not approach the real article. Dr. Hill's experience, however, was that properly regulated arc-light baths, with advice as to exposure to the open air, exercise, and diet, could effect cures in London which appeared to be no less good than those reported from Alpine sanatoriums. In order to eliminate tuberculosis from cattle similar exposure to light and air should be secured. Cattle as well as children might be given arc-light baths in the winter. Cattle also needed food rich in vitamin A during the winter and calcium to compensate the drain caused by heavy milking. Vitaglass, which allowed the ultra-violet rays to pass through, might have a use for verandahs and skylights.

Dr. G. B. Dixon (Tuberculosis M.O., Birmingham) said he had obtained good results in many forms of tuberculosis from the general light bath. Cases of lupus did well. Enlarged cervical glands first grew bigger and then gradually disappeared. Cases of hilus tuberculosis did well. Some bone and joint cases did well, while hip, sacro-iliac, and spinal cases did not, in his experience, show such good results. The tone of the muscles improved greatly under treatment. Non-pigmenters had to be treated more carefully. In some bone and joint cases with concurrent pulmonary disease the improvement in the bone or joint condition had taken place without the pulmonary lesion becoming worse.

Dr. Dora Colebrook gave her experiences of light treatment at the Islington centre. Small babies suffering from dietetic trouble did very well. Flabby muscles were toned up. In cases of malnutrition and vomiting the vomiting often ceased. There was an increase in vigour and brightness. Relapses after the cessation of treatment indicated success and the need for more continuous treatment. She believed in short courses of short exposures and found the treatment useful for nursing mothers. There was a distinct place for light treatment at infant welfare centres. She hoped that other centres would try the treatment and keep faithful records of the results obtained.

Dr. A. Eidenow said that many chronic fibroid pulmonary cases did extraordinarily well under light treatment. Infants and adults differed in their need of light. Beneficial effects were secured in very many resistant skin diseases, such as psoriasis and eczema. In the case of bone-tubercle, radiograms showed that there was increased calcification and density of the bone as the result of light treatment.

BAN ON POOR-LAW BUILDING.—The Minister of Health has refused to sanction the scheme of the Kensington Guardians for the enlargement of the X ray department and the erection of a new nurses' home at Kensington Infirmary. Mr. Neville Chamberlain declines to regard the plan as urgent, and adds that "in view of the scarcity of skilled labour available for housing schemes, and the uncertainty as to the future of the Poor-law generally, it is considered that all Poor-law building work which is not immediately necessary should be postponed."

SUSSEX PROVIDENT SCHEME.—The following amounts have just been paid to the institutions named for services rendered to subscribers of the Sussex Provident Scheme during the first six months of this year: Royal Sussex County Hospital, £1540; Royal Alexandra Hospital for Sick Children, £340; New Sussex Hospital, £325; Brighton, Hove, and Preston Dispensary, £150; Haywards Heath Hospital, £135; Sussex Eye Hospital, £115; Sussex Maternity and Women's Hospital, £105; Sussex Throat and Ear Hospital, £105; Brighton, Hove, and Preston Dental Hospital, £65; Uckfield Cottage Hospital, £50; Stephen Ralli Memorial Laboratory at the Royal Sussex County Hospital, £10; and Royal East Sussex Hospital, Hastings, £5. These sums make a total of £2945 for the half year. For the whole year of 1924 the amount distributed among the hospitals was £5520.

Rebiews and Notices of Books.

SURGERY.

Practical Surgery Illustrated. By VICTOR PAUCHET. Translated by F. R. B. ATKINSON, M.D., C.M. Edin. With an introduction by Sir CHARLES GORDON-WATSON, C.M.G., F.R.C.S. Vols. V. and VI. London: Ernest Benn, Ltd. 1925. 18s. 6d. per volume.

THESE two volumes complete the English edition of Pauchet's atlas. Like the former parts, the drawings are unique in their clarity and depict the most varied procedures. In Vol. V. de Martel describes the operation for trigeminal neuralgia. The rest of the book is by the author, except Chapter IX. on the treatment of large scrotal hernia, which has been drawn up by A. Buquet. Pauchet's chief work lies in the abdomen, and his conclusions and remarks on the conditions delineated are interesting and full of suggestion. Some of his results are remarkable. He has implanted into the duodenum, with success, a persistent biliary sinus resulting from cholecystectomy, the patient being well 15 years later. In two other cases the common bile-duct was repaired around a tube and the patients are well seven and nine years after it. The author is at his best in describing gastric operations, of which he is a master. Another extremely good section is that dealing with carcinoma of the colon. In Vol. VI. different aspects of these two subjects are again brought in review. The operation for fistula in ano is described, the inguinal operation for femoral hernia, removal of a ureteric calculus, and some gynaecological procedures. The work now completed makes no pretension to be a complete treatise on operative surgery, of which many departments remain untouched, but the discriminating surgeon will find the book profoundly interesting and will lay it down with a sense of having profited by its perusal.

Die Chirurgie. By Prof. Dr. M. KIRSCHNER and Prof. Dr. O. NORDMANN. Berlin: Urban and Schwartzberg. 1925. Vol. I., 18 marks; Vol. II., 18 marks.

A System of Surgery by a number of German-speaking contributors is appearing under the general editorship of Profs. Kirschner and Nordmann. Two volumes of this system are now before us. The first begins with an historical account, necessarily in bare outline, of the development of surgery, which will prove useful for its very complete bibliography. General and local anæsthetic methods are next discussed, followed by a section on antiseptic and aseptic methods. These chapters lose somewhat by compression; the English reader would have been glad to learn more of the local anæsthetic methods in vogue, for instance, and only one way of sterilising catgut is described. On the other hand, the chapter on the use of X rays and radium in surgery contains just what the general surgeon desires to know, and a well-balanced view of the therapeutic value of these agents is given. An account of X ray burns is included. The last chapter in this volume deals with constitution in relation to disease, an unfamiliar section to the English reader and worth perusal. The second volume, which is concerned with the surgery of the lymphatic glands, breast, thyroid, thymus, adrenals, and hypophysis, leaves little to be desired. The accounts of the diseases treated are systematic, straightforward, and conform to generally accepted ideas. The chapter on the breast contains a very complete set of illustrations of normal and morbid anatomy.

So far as it goes at present this System of Surgery can be cordially recommended to the English reader. Not the least of its merits is that it is essentially German in its outlook. To see things from the standpoint of an entirely different school of surgery

is always profitable. Thus we find matters over which there is controversy in this country regarded in quite a different light in this book. For instance, fibro-adenoma of the breast is classified amongst the epithelial tumours, and the statement is made that it more easily changes into a carcinoma than a sarcoma. Carcinoma of the breast is accepted as spreading by the venous path at a certain stage of the disease. A number of statements will make the English student speculate upon the basis for his accepted beliefs. The standard of writing is high and the illustrations are admirable.

Chirurgische Propädeutik. By Prof. Dr. ERICH SONNTAG. Leipzig: George Thieme. 1925. Pp. 269. R.m. 9.60.

THIS book is for the use of students just beginning their clinical work. The author intends it to give instruction in those methods of examination which can be carried out with the unaided senses. So the book is divided up into sections which deal with the interrogation of the patient, inspection, palpation, auscultation, smelling, and measuring. Each section is divided into a general and a special part. Elementary methods of diagnosis are notoriously difficult to teach to the novice, and instruction of this kind is best given practically in the wards. Owing to the arrangement followed in this book, the students would have to refer to several sections if he desired to know how to examine, for instance, a tumour of the breast. Nevertheless, methods of clinical examination, as far as it is possible to impart such knowledge by the written word, are well described, and the illustrations are helpful.

CLINICAL PATHOLOGY.

Serum Diagnosis of Syphilis by Precipitation. By R. L. KAHN. Baltimore: Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1925. Pp. 237. 15s.

IN this book the author gives an account of the precipitive test he has devised for the diagnosis of syphilis. The complicated technique required in the Wassermann test has stimulated many workers to produce a simpler test. So far a certain amount of success has been obtained by the precipitive methods based on the works of Klausner, Sachs Georgi, and others. The test depends on the fact that when syphilitic serum is mixed with the ordinary Wassermann antigen, or with a special antigen, a fine precipitate is formed. In the Kahn test for syphilis detailed in this monograph very careful standardisation of all the ingredients is performed as a preliminary to the main test. In fact, so numerous are these standardisations that it is doubtful if the Kahn test can be considered to be any less complicated than the Wassermann test itself—except for the fact that there is in the test one less variable factor, the complement. The test can be used for cerebro-spinal fluid as well as blood. Details are given of comparative tests against the Wassermann reaction, in which the test came out well, but it will, of course, take years before the real value and reliability of the test can be determined. This volume is chiefly intended as a technical manual for laboratory workers and as such gives an admirable account of the test and the technique employed.

The Cerebro-spinal Fluid in Clinical Diagnosis. By J. GODWIN GREENFIELD, M.D., B.Sc., M.R.C.P., Pathologist to the National Hospital for the Paralysed and Epileptic; and E. ARNOLD CARMICHAEL, M.B., Ch.B., Resident Medical Officer, National Hospital for the Paralysed and Epileptic. London: Macmillan and Co., Ltd. 1925. Pp. 272. 12s.

THE need of an authoritative work in English upon this subject has now been supplied. The book before

us opens with a very detailed and satisfactory account of the technique of the operations of lumbar, cisternal, and ventricular punctures. The anatomy of the membranes of the brain and cord and the physiology of the cerebro-spinal fluid are competently dealt with in Chapter II. To the laboratory worker the section on technique will prove particularly useful.

The authors lay great stress upon their indebtedness to the work of Westrejat, and it is true that no one working upon the changes undergone by the cerebro-spinal fluid in disease can fail to recognise this debt. Perusal of the book, however, makes it evident that it contains few, possibly no statements the truth of which has not been actually tested by the authors themselves, and a good deal of the value of the book depends upon their own original observations. There are a number of long-recorded observations the value of which has escaped recognition and the authors do good service merely in drawing attention to them. Such a hitherto rather neglected observation is the lowering of the chlorides in the cerebro-spinal fluid in tuberculous meningitis. That this is the first and for a time may be the only sign of tuberculous invasion of the meninges is a fact that has hitherto escaped the attention it deserves. In dealing with the glucose content of the cerebro-spinal fluid the authors seem to overlook the wide fluctuations undergone by this substance in the blood under normal conditions.

This is a work which will make a wide appeal; it contains much matter of the utmost importance to medical men, whether in practice or working in the laboratory, hitherto only available in a foreign language or scattered through the pages of periodicals and proceedings. The authors have arranged their matter so that both the clinician and the laboratory worker can readily find exactly what they want.

PREMATERNITY.

Candid Counsels to Expectant Mothers. By FLORENCE STACPOOLE. London: A. and C. Black, Ltd. 1925. Pp. 173. 3s. 6d.

THIS book has been written for young or expectant mothers, especially those of the educated classes, by a lecturer to the National Health Society of London who knows her subject thoroughly and writes on it convincingly and well. The four sections of the book deal adequately with: Care of the health during pregnancy; care of the health during confinement; care of the health after confinement; care of the new-born infant. Short appendices contain information on the preparation to be made for the baby's arrival, twilight sleep, birth control, and the method suggested recently by Prof. Louise McLroy of oiling the baby in lieu of washing it with soap and water during the first nine days after birth. The author's style is chatty, but the book is pleasant to read. Some misgiving may be felt as to the wisdom of including in a book written for mothers so many prescriptions—e.g., a diarrhoea mixture containing laudanum and several mixtures for indigestion—but apart from this we have nothing but praise for a guide-book which should command a wide circulation among nurses and expectant mothers.

Approaching Motherhood. By GEORGE L. BRODHEAD, M.D. New York: Paul B. Hoeber. 1925. Pp. 193. \$1.25.

THE purpose of this book is to answer some of the questions which most women approaching motherhood are likely to ask. The contents are therefore arranged in the form of question and answer, the range of subjects discussed covering the period from pregnancy to the puerperium. Some of the sections are extremely short and sketchy, such as that on the anatomy of the female genital tract, which is discussed in less than 60 lines. The chapter on popular fallacies deals with only four fallacies, one of which—"that it is dangerous to raise the arms

above the head for fear of causing a knot in the cord"—we do not recollect having come across; another, "that pregnant women have what is known as cravings," is a fact and not a fallacy at all. Some of the points raised are trivial—e.g., Do babies ever weigh 15 pounds? Is the theatre harmful? Am I carrying high or low? do not appear to be particularly helpful. And on one or two points the author is in disagreement with accepted views in this country, when he urges, for instance, that the "comparatively small and harmless operation" of circumcision shall be performed on every boy within two weeks of birth; or that a baby should have its mouth swabbed out with cotton and boric acid at the time of the daily bath. The book is written in plain and simple language.

CHILD WELFARE.

The International Year Book of Child Care and Protection. Second edition. Compiled from official sources by EDWARD FULLER. London: Longmans, Green and Co. and *The World's Children*, Ltd. 1925. Pp. 565. 7s. 6d.

THE new edition of this year-book is expanded and improved. Opportunity has been taken to revise the tables and a hundred or more of the sections have been practically rewritten. The "Who's Who" section has, we are glad to see, been omitted, its place being taken by an international bibliography of books and periodicals published during 1924 on child care and protection. Dr. W. M. Feldman has contributed a chapter on Hebrew law in relation to children, and the index has been amplified. Mr. Fuller, who is editor of the *World's Children*, remarks how little one-half of the world knows even yet as to how the other half lives, and the primary object of the year-book is to help the peoples of the world to a better understanding of the things which concern the life and care of its children. As a compiler, he has been embarrassed by the lack of common standards in making statistics and classifying facts. Even in England the legal definition of "infant" is not commensurate with the accepted use of the term, and disparities of this nature vitiate comparisons which might usefully be made. The year-book is one more plea among many for reform in the demography of child welfare. Mr. Fuller's book in its new guise will usefully serve the interests of children in many countries.

LEGAL MEDICINE.

For Members of the Legal Profession and Police Forces. First edition. By JOHN GLAISTER, Junr., M.B., Ch.B. Glasg., Assistant to the Professor of Forensic Medicine, University of Glasgow; Lecturer on Medical Jurisprudence to the Glasgow Police Force. Glasgow: Alexander Stenhouse. 1925. With 4 illustrations. Pp. 158. 5s.

LEGAL medicine is approached from very different angles by the doctor, the lawyer, and the police officer. Points which may appear of great importance to the medical man may be of secondary significance to counsel conducting a prosecution or a defence. The police officer is concerned with the tracking of the criminal and collecting all the available evidence, whilst the lawyer sifts this evidence in order to present his case. Dr. Glaister has attempted to put to members of the legal profession and to the police force the medical point of view, and to illustrate the working of the medical mind when medico-legal problems are involved. He has also set out the difficulties with which the doctor has to contend and the dangers of dogmatic statements. The book appears to be the outcome of lectures to the police force at Glasgow, and as such forms an excellent manual for their guidance, especially in the direction of enabling the police, whether by action or inaction, materially to assist the medical man in his duties.

Dr. Glaister discusses the signs of drunkenness, describing pupillary reactions, and gives differential points for the diagnosis of a fit. The police officer should, of course, regard every case as serious until the surgeon has given his opinion, and the risk lest a little learning should lead the police officer to make rash diagnoses is, we think, very small. To the lawyer the work is more limited in its usefulness. It may enable him to appreciate rapidly the significance of many medical conditions of criminal import, but where a prosecution or a defence involves more detailed consideration he will need to consult a larger text-book. Dr. Glaister, however, finds space to discuss in detail several classical criminal cases, aptly making his points from the lessons learned in these cases.

The book is simply and clearly written and the author has collected much practical information into a small space.

CHAMBERS'S ENCYCLOPÆDIA.

A Dictionary of Universal Knowledge. Edited by DAVID PATRICK, LL.D., and WILLIAM GEDDIE, M.A., B.Sc. Vol. III., Cata to Diop. Vol. IV., Diop. to Frei. Vol. V., Frei. to Humb. Vol. VI., Hume to Man. London: Chambers's. 1925. 20s. per vol.

THIS encyclopædia is large enough to furnish an adequate outline of any subject referred to without being too bulky to fit into an average study library. The style of printing is attractive—the title of each article standing out in bold type; the information is concise and accurate and for the most part up to date. In some of the more technical articles where recent discoveries have altered the whole aspect of the subject, the addition of new paragraphs hardly meets the situation and an entirely new article is called for. The article on Embryology, for example, in Vol. IV. contains many references to work which is not now the last word on this rapidly growing subject. In Vol. VI. the historical account of the development of the University of London well explains the anomalies of the present organisation, while the description of the foundation of activities of the League of Nations, including its important health sections, is excellent. Indeed, it is impossible to turn over the pages of these volumes without being arrested by a title, an engraving, or a map which suggests a new point of view, or makes clearer the panorama from an old one.

JOURNALS.

INDIAN JOURNAL OF MEDICAL RESEARCH. April, 1925.—This number is of special interest. E. D. W. Greig and S. Kundu contribute three papers on Kala-azar, in one of which they compare the effect of treatment with various recently prepared antimony compounds, such as urea-stibamine and stibamine glucoside.—J. A. Sinton continues his series of studies on the Indian Species of Phlebotomus, paying attention to *P. argentipes*, the species recently suspected as being the vector of kala-azar, while R. B. Lloyd, L. E. Napier, and R. O. A. Smith have studied the blood meal of this insect identified by precipitin antisera, from which it appears that the insect feeds on the blood of cows in preference to that of man; the inference is drawn that the distribution of this disease observed in India is dependent on the absence of these animals from certain districts.—J. Cunningham and S. R. Pundit describe a new endemic focus of kala-azar in Southern India, L. E. Napier the environment associated with its prevalence in Calcutta.—U. N. Brahmachari and B. B. Maity continue their studies on the Chemotherapy of Antimonial Compounds.—M. J. Parmanand contributes the second part of his studies on the organism of rat-bite fever.—L. A. P. Anderson, A. Howard, and J. L. Simonsen have made important observations on the aetiology of lathyrism in India. The number also contains the eleventh section of W. F. Harvey's "bacteriological and laboratory technique."

THE LANCET.

LONDON: SATURDAY, AUGUST 15, 1925.

VOLUNTARY HOSPITAL ACCOMMODATION.

SOME four years ago when, particularly as an aftermath of the war and generally as a result of social changes, the whole voluntary hospital system in this country was ailing, the Government provided a stimulating draught of £500,000 to be administered pro rata to institutions which showed a readiness to help in their own cure. The distribution of this sum was entrusted to a Voluntary Hospitals Commission appointed in 1921.¹ This is the point chosen here to begin comment on a long story. The Commission accomplished their task with what must have been unhoped-for success, considering its nature, and then undertook, in April, 1924, at the instance of Mr. WHEATLEY, then Minister of Health, "to inquire into and report upon the extent of the additional voluntary hospital accommodation required in England and Wales and the best means of providing and maintaining it." The report on this work, which has just been issued,² is a record of valuable and painstaking labours, and the information obtained sets forth a proof of the vitality of the voluntary system and of its hold upon the country.

It might have been an easy matter to erect ideal standards of hospital accommodation without regard for time or money, but the Commission have left such ideals alone, concentrating upon the consideration of such extensions as were immediately necessary, and such, which is more, as were capable of accomplishment within a reasonable period. The careful study of the answers to questionnaires sent out to all the voluntary hospitals through the local voluntary hospital committees, wherein all the facilities for the institutional treatment of disease in each locality were collated, has made it possible for the Commission to formulate practical and valuable propositions for the solution of many sides of a complicated problem. The accommodation of our voluntary hospitals, as everyone knows, is at present inadequate to the needs of the people; the inclusion in any estimate of all the subsidiary accommodation provided by cottage hospitals, and convalescent and recovery homes still leaves it badly short, while the Poor-law infirmaries remain only potential adjuncts. It is of interest to note that the data furnished by hospital waiting-lists proved, on close inspection, to be an unreliable basis for assessment. It was found, for example, that maternity cases for which beds had been booked weeks or months in advance were sometimes included in the waiting-list figures, while on the other hand a notable shortness of the list in an area where the accommodation was obviously inadequate might be explained by the reluctance of medical practitioners to enter the names of patients whose chances of admission were merely problematical. With regard to coöperation with Poor-law infirmaries, the report states that astonishing differences were found in the attitude of different areas towards Poor-law institutions. The majority of local committees were unfavourable to coöperation; when schemes of

mass contribution are in existence, it appears that the public regard any plan for coöperation with Poor-law infirmaries as an attempt on the part of the voluntary hospitals to escape an implied bargain; further, in many parts of the country prospective patients have strong prejudices against Poor-law beds. On the other hand, however, from a careful inspection the important fact emerged that the number of vacant beds in institutions at all comparable with voluntary hospitals was much smaller than was commonly supposed. If Poor-law hospitals are to be conscripted for further service, their function, it would seem, must be differentiated from that of the voluntary hospital; those who know more than the surface of the matter will not be surprised to learn that the filling-up of the infirmaries with the surplus sick is not the prompt remedy that many speakers have told us. The Commissioners suggest that the larger voluntary hospitals be reserved for cases requiring special diagnostic facilities or a high degree of technical skill, while the local authorities' hospitals should deal with patients whose primary need is skilled nursing. In allocating the many gradations between these two types of case requiring treatment, individual and local considerations would be the deciding factor in the choice of institution. The patient suffering from surgical tuberculosis, for whom the local authority has a statutory responsibility, has been indicted as the cause of much present pressure on voluntary hospital beds. The Commission believe that if local authorities undertook the provision of beds for all their cases, whether by paying the capital cost of any necessary hospital extension or, in the case of surgical tuberculosis, by adding surgical wards to existing sanatoriums, a considerable number of existing beds would be released for other cases. Many of the smaller hospitals, particularly the cottage hospitals, are at present not adequately used. In many instances this is due in large measure to difficulties in regard to suitable medical and surgical staff, and the Commission advocates the linking up of such institutions with the nearest big hospital. The future multiplication of cottage hospitals does not find favour with the Commissioners, who hold, also, that the extension of convalescent homes would do little to relieve in-patient pressure. But there is a considerable weight of opinion in favour of increasing the number of available recovery homes, a system which is as yet only in the experimental stage.

The outcome of the investigations of the Commission is that some 10,000 additional beds are required in England and Wales, including London. The actual figures submitted by local committees outside of London amounted in England to 9525 beds and in Wales to 1089 beds, or a total of 10,614 beds, and King Edward's Hospital Fund recommended an addition in London of 2088, but after careful consideration of the reports of the Commission's inspectors it was thought that that total figure might be reduced by about 20 per cent. The addition of 10,000 beds represents an increase of approximately 22 per cent. on the existing hospital accommodation. At present-day prices, excluding the cost of site, furniture, and equipment, it is estimated that a reasonable figure for the cost of extending plain buildings of a utilitarian character would be £400 per bed. This represents a formidable sum, and the Commissioners find themselves forced, however, reluctantly, to the conclusion that a substantial measure of State aid is essential. There are many pitfalls to be avoided, as the report points out, in administering a State

¹ THE LANCET, 1924, II., 615.

² Ministry of Health. Voluntary Hospitals Commission. Report on Voluntary Hospital Accommodation in England and Wales. H.M. Stationery Office. 1925.

grant in order that, among other things, the voluntary principle may not be endangered, while needs and expenses vary in different localities. The proposal submitted by the Commission is therefore to allow a grant of 50 per cent. of the cost up to a maximum of £200 per bed, subject, of course, to the remaining 50 per cent. of the expenditure being raised locally or being available from existing building funds. It is further proposed that the task of formulating comprehensive schemes for local areas should devolve on the local committees of the voluntary hospitals. It may be that, in view of these extra duties, such committees will require extension and reorganisation, and to secure the fullest measure of effectivity the Commissioners do particularly urge the importance of full and frank conference with the medical staffs of the hospitals concerned. The Commissioners are prepared, if the Government see fit to accept their proposals, to act as a central body responsible for the distribution of this grant.

We trust that the Government will come to the aid of the voluntary hospital system in the suggested way; for on all sides the improving prospect is admitted. Without the assistance and encouragement of the State there is in most cases little chance of essential extensions being undertaken within the next few years. Failure to meet the present needs of a growing population will not only entail a great amount of avoidable suffering, but it must also react to the prejudice of the voluntary system. There is no greater stimulus to subscribers, particularly to small subscribers whose regular support is essential to the solvency of voluntary hospitals, than the feeling that sufficient accommodation is provided to ensure reasonable hopes of admission. And it must be remembered that small subscribers, in the form of contributing patients, grow daily a greater financial asset.

MIND AND BODY.

Of all concepts that most often to be used casually is among the least definable—namely, “mind.” At the present time it has taken on a biological significance and expresses the life reaction of the entity which anatomically is represented by “the organism.” No longer is mind regarded as a something essentially apart from body; psychology now moves hand in hand with physiology, though we are still far from making the relations definite. It is evident, however, that, though the central nervous system is essential for the function of mind, mental function involves much more than just that one system of the body.

Dr. JOSEPH SHAW BOLTON, for his recent Maudsley lecture, read before the Medico-Psychological Association,¹ chose as title *Mind and Brain*, and the matter and tone of his discourse throw into strong relief the controversy between the two opposing schools of mental research, the practical anatomists and the experimental psychologists. The lecturer belongs to the former and takes a determined stand on the facts that have been indisputably proved by years of patient anatomical labour. He regards the work of FREUD, McDUGALL, and others who bring speculation and conjecture to elucidate their observations as an unfortunate and mischievous excrescence that so far from being of any service can only result in vitiating the work of men who, from their hard-won knowledge of the structure of the brain, are qualified to speak with authority on the nature of the mind. In the lecture he gives an able comparative survey of the

anatomy and habits of insects, birds, and mammals, and includes sound comments on human psychology. Dr. BOLTON exposes the error that many habitually make of attributing human motives to lower animals; he shows that bees and ants have no kind of reason or sentiment to guide their collective labour, and that the behaviour of the trained bird is but an elaborate mechanical reaction. Both insects and birds have a rigid skeleton that has ensured their survival at the price of completely forbidding them to evolve further. He gives a detailed analysis of the brain measurements of a tom tit, a parrot, and a pheasant, showing that the cerebral pallium that gives the mammal its variety of function and capacity for further development is in all these representative birds a simple root to the lateral ventricle. He concludes from this that birds are merely elaborate machines, possessing neither mind nor a nervous mechanism for the evolution and performance of mental functions, a result certainly that it would be hard to controvert on the behalf of the many bird-lovers who claim for their pets an almost human intelligence. Dr. BOLTON sketches the development of mammals and shows that the growth of feeling and thought processes in higher animals like dogs and anthropoid apes depends entirely on the evolution of the highly complex cerebral pallium. His treatment of psychology—the disputed territory between himself and Prof. McDUGALL, whom he quotes destructively throughout—is the climax of his lecture. He deals ably with language, voluntary thought, recorded experience, and recollection, the meaning of normal personality, of grades of cerebral activity, and of free association and dreams; after an analysis of feeling, and of the relative importance of education and the instincts, he considers mental disease, the best existing example of racial immaturity. He holds that the variety of mental deficiency and dementia amongst us indicates how slowly our minds evolve. “The greater the rapidity of evolution the more numerous the variations above and below the average—the more common must be individual genius and individual mental deficiency and dementia.” Comparing human voluntary thought with the caricature of it seen in the lower animals, he holds that we are irresistibly impelled, “not to the idea that the lower animals think, but to the certainty that in the mass human beings do not.”

Considering how valuable is Dr. BOLTON's insistence that truth must be sought by patient spade-work in the observation of facts, we regret the manner of his attacks on the concept of the “unconscious mind,” and by implication of the spade-work of those observers who have invented and enlarged upon it. Truth is to be found by establishing facts, not by stating negatives—indeed, to quote Dr. BOLTON against himself, “even if many theories turn out to be false and many facts prove to be valueless, the individual who has produced them, so long as he has worked honestly, is the better for what he has done.” Psychological function depends on brain structure, but brain anatomy is unintelligible unless the psychologists explain it. That function results in an extraordinary development of structural provision for possible future function the lecturer allows, and may it not be that the “unconscious mind” of the psychologists is the vague functioning of that unrelated structure of the brain pallium which stands ready to be specialised and developed as the human race moves forward towards its fulfilment? Truth at best is but a relative phenomenon, varying in its facets in accordance with the view-point of the observer. Considering the difficulty of the task in which workers

¹ Journal of Mental Science, August, 1925.

in these fields are engaged, it is of the highest importance that every searcher for knowledge towards the understanding of life should realise that the truth may, nay must, be many-sided, and that, because his truth does not at once conform to another's, therefore the other is wrong. It is unfortunate that the broad view is so rarely to be found, but let us plead for a more concerted attack upon this most evasive of problems, seeking that the recognition of the usefulness of principles, whether psychological or physiological, be not obscured by the unbalanced and premature forcing of conclusions.

RHEUMATIC INFECTION IN CHILDHOOD.

FROM the point of view of public welfare few subjects could be found of greater importance than that of rheumatic infection in childhood, which was discussed at a joint meeting of the Sections of Diseases of Children and of Public Medicine at the annual meeting of the British Medical Association on July 22nd. The toll of human life from heart disease originating from this cause during the school age amounts, according to Dr. ROBERT A. ASKINS, of Bristol, to between 12,000 and 20,000 annually in England and Wales alone, whilst the hospitals have difficulty in finding accommodation for both the early cases and those suffering from serious sequelæ. A full account of this discussion will be found elsewhere in this issue, where it will be seen that practically all the speakers urged the need for speedy research into the many problems involved. Dr. F. J. POYNTON, who has done great public service during many years in this respect, reiterated the necessity for closer inquiry concerning various ætiological factors, especially as regards home surroundings, the various modes of onset, the prevalence of chorea, and the importance of nervous over-strain among school-children. There appeared to be little doubt in the minds of the various speakers as to the infective nature of the disease; but many of them, including Dr. ROBERT HUTCHISON, the President, held strongly to the view that acute rheumatism cannot properly be described as a disease of slums, but is rather to be found amongst the children of the more well-to-do artisan class. This belief is borne out in an article by Dr. VINCENT COATES and Dr. R. E. THOMAS which we publish to-day. These observers have made careful clinical and ætiological inquiry concerning 50 cases selected at random from a much larger series of school-children seen during school inspection and at clinics. They find that in practically every case the parents of the affected children were in steady work and belonged to the skilled artisan section of society, the weekly gross income per head of the various families being from five to seven shillings in about 45 per cent. of cases and above this figure in the remainder. In a considerable number of cases the houses inhabited by the patients were damp, but overcrowding was notably absent. As regards treatment the most pressing need of the moment was considered by most speakers to be the establishment of more clinics for the care of such children, and the provision of institutions where long-continued rest could be properly obtained. The success of the Hartfield Hospital in Sussex has in this respect been very encouraging. In view of the drain on the life and wealth of the population which rheumatic fever and its consequences at present entail, expenditure on such establishments and on adequate research centres should be a sound national investment.

Annotations.

"Ne quid nimis."

THE MEMBERSHIP OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

WE do not know if the significance of the amended By-law 112 of the College has been fully appreciated by our readers. The by-law now runs, "Every candidate for the Membership shall furnish proof of having attained the age of 23 years," whereas the age for admission to the examination for the diploma was formerly 25 years. This means that men of 23 years of age can now take the examination and gain the diploma without waiting for two years, by which time many of them have settled down into practice and have neither the time nor the inclination to submit themselves to an examination. Many men at 23 have just finished house appointments, and their examination knowledge having not yet faded, their recent clinical experience admirably fits them for the trial before them. In the past some men, who might have secured the M.R.C.P. had they been 25, have embarked on some special line of work, such as pathology or X rays, and so when they became eligible were both immersed in special work and lost touch with general medicine, and especially with the important branch of routine clinical examination. As time went on these men rose to eminence in their special branch of medicine, but were not eligible for the F.R.C.P. because they had not taken the M.R.C.P., and they and also the Royal College of Physicians of London were the losers. At the Royal College of Surgeons of England the final examination for the F.R.C.S. can be passed before the age of 25 years, while the successful candidate has to wait for the diploma until he attains that age. At the Royal College of Physicians of London this relaxation was not allowed.

AN HISTORICAL REVIEW OF PUBLIC HEALTH.

WE print this week the fourth and last instalment of Dr. J. H. L. Cumpston's reflections on public health administration, provoked by a visit to America and England paid by him in his capacity of principal administrative health officer to the Commonwealth of Australia. Dr. Cumpston lays his finger on some weak points in administration which are largely the result of the haphazard way in which the whole structure has grown up. No doubt his kindly but trenchant criticism will be taken to heart by those concerned, and we propose in the next few weeks to provide further material for laying down sound principles of international hygiene by seeing how the various European countries have solved the problem in the light of careful studies made by the Health Bureau of the League of Nations.

During the present year several other senior members of the medical profession have written sketches of the motives and principles which have actuated public health progress. Sir Arthur Newsholme in his book emphasised the fundamental value of the crude dictum that the search for public health was a crusade against organic filth, though the value of personal hygiene is fully recognised in its pages and scientific work with educational effort to secure its application are urged. Prof. E. A. Winslow, of Yale, has stressed the personal side of public health work, the value of public health nursing, and of educational work. It is evident that only by a *vue toute ensemble* can the whole truth be encompassed. The sketch¹ now before us by a distinguished leader of the medical profession in America will prevent any too narrow view of the factors of reform which have preceded our present

¹ Public Health in Theory and Practice: An Historical Review. By W. H. Welch, M.D., LL.D. Yale University Press. London: Oxford University Press. 4s. 6d.

condition. The occasion of the second annual Sedgwick lecture was utilised by Dr. W. H. Welch, of Baltimore, to review the pioneer work of this great American sanitarian. Dr. Welch contends that America's chief contribution to public health progress has been in the extended use of the laboratory as a means of control of disease; and the outstanding examples of this are the work of the Lawrence Experiment Station on water purification and the introduction by Hermann Biggs of laboratory diagnosis as a means of controlling infectious disease in New York. A more recent contribution of America to public health consists in its prohibition of the sale of alcoholic drinks, and it is not irrelevant to contrast this with Dr. Welch's reference to the compulsory control of a disease by diet as evidenced by the obligatory administration of lime-juice begun in the British Navy in 1796. The lecture brings out very lucidly the value of a working hypothesis in the advancement and application of knowledge, and the whole history of public health can be written around successive hypotheses on which action, more or less successful, has been based. In respect of tuberculosis we have the well entrenched older views of the constitutional element in tuberculosis, and on the other hand the remark of Koch, which Dr. Welch heard him make, that so far as tuberculosis is concerned "predisposition is merely proximity to the bacillus." Attention is drawn to the millions spent for the eradication of yellow fever, and wasted, under the influence of a wrong hypothesis as to its origin; and it is added "the same is largely true of typhus." This remark cannot be taken too literally, for from England typhus had been almost completely banished before its transmission by body lice, and probably in no other way, was suspected. The lecture is worthy of its author and will be read with interest by all. Dr. Welch rightly takes the view that courses of hygiene in the medical student's curriculum do not suffice; for there is no subject of medical study without some bearing on preventive medicine, and every teacher should consider it his duty to emphasise these aspects.

DENTAL PROPAGANDA.

At the May meeting of the Dental Board of the United Kingdom a good deal of time and thought were given to the subject of propaganda on the care of the teeth. Mr. F. Dyke Acland, the chairman of the Board, stated in his opening address that he was impressed by the amount of general good-will existing in many quarters towards the great object which the Dental Board had in view—namely, the improvement of the dental health of the nation. He expressed his belief that effective publicity might be attained without very considerable expenditure, if only it was properly directed and guided, and at a later stage in the proceedings the Board went on to allot a sum not exceeding £4000 during the present year for the purpose of propaganda. So far the publicity work of the Board has largely been in association with education and health authorities. During last year, for instance, more than 132,000 copies of a leaflet were distributed through 347 education authorities among teachers in primary and secondary schools; requests for dental films, including the popular "Tommy Tucker's Tooth," were received from 25 education and health authorities. But the Board, not content with this valuable educational work, set up an Advisory Committee with a view to working out the methods for a more general campaign. This Committee included representatives of the various dental associations, the Board of Education, the Food Education Society, the National Association of Insurance Committees, and of a number of manufacturers of dental supplies. The recommendations of this Advisory Committee, as presented to the Board, included the spending of a sum of £7000 in the first year on a scheme of press propaganda, the engagement of a journalist of suitable qualifications, and the envisaging of a campaign lasting three years at least. It is in this direction that some members of the

dental profession, and those not the least influential, are feeling that the Board may be going a little too fast. An editorial article in the *British Dental Journal* for August regards the proposals with dislike, if not alarm, as an abandonment of the cherished tradition inculcated by the British Dental Association for nearly half a century—"Thou shalt not advertise." In this article it is pointed out very forcibly how the "stunt game" is now so irrevocably associated in the public mind with some private interest lurking behind it, that the advertising pitch has been spoiled for orthodox professional play. The *Journal* is all in favour of propaganda through educational authorities, school teachers, medical officers of health, health societies, and the like, and sees in the education of parent and child in good dental habits, through the provision of good school dentistry, an agency for improvement without reproach. It is rather a piquant position for the dental profession, a section of which has in the past not been loth to use all available methods of publicity, now to be putting the brake on the Dental Board's proposed campaign of propaganda. We are in full sympathy with propaganda on the need for a healthy mouth, but we share the dislike felt by the *British Dental Journal* for a scheme of propaganda which entails extensive press publicity, the engagement of a special journalist, and a request for subsidies from the dental profession and the dental trade. With regard to the dental trade, we are sure that the best manufacturers concerned wish for no such publicity; and whatever its immediate success, the public will inevitably suspect in it a subtle way of increasing the income of the dental profession. It would, we believe, defeat its own end, and the *Journal* is probably right in thinking the scheme to be in the nature of a kite flown by the Board to test the feeling of the dental profession.

EYE SURGEON AND NURSE.

It has often been said or implied that it is not the business of the nurse to know anything about the procedures which the surgeon may choose to adopt. But many surgeons have found that it is just such knowledge which is likely to increase her value, and certainly a theatre sister who does not know the uses of the instruments of which she has charge is likely to make mistakes which one who has familiarity with their use will avoid. For the nursing of eye cases a general training is not enough, and for operative work it is genuinely essential for the nurse to have expert guidance if she is to do justice to her patient. For these reasons we should like to commend a practical handbook¹ for the ophthalmic nurse which she cannot fail to find useful. This little book is evidently written by one who has had experience in the training of probationers in an eye hospital. It is neither too elementary nor is it prolix. Written in simple language, each chapter is of practical value and the illustrations are very clear. Just so much explanation of the anatomy of the eye is given as nurses need. Bandaging is well illustrated and a form of bandage described which, so far as we know, is peculiar to the Western Ophthalmic Hospital, where it is found to be very effective. After a chapter on the external diseases of the eye, which includes essential directions to the nurse in dealing with cases of contagious ophthalmia, she is introduced to the operating theatre, and the greater part of the book is taken up by an excellent description of her duties in the preparation of patients for operation, in the operating theatre itself, and during the after-treatment of operation cases. A useful chapter is appended on operations in a private house. In the section on local anaesthesia stress is properly laid on precautions against the roughening of the corneal epithelium that a careless instillation of cocaine causes. Exact directions are given for sterilising dressings, preparing swabs, and the sterilisation of sutures and

¹ *Ophthalmic Nursing*. By Mary Mason Springgay, Matron of the Western Ophthalmic Hospital, London. With 67 illustrations. London: Methuen and Co. 1925. Pp. 133. 5s.

instruments. The directions for the after-treatment of cataract cases are full and include such points as how the nurse can help in a case of temporary retention of urine, and how best to arrange the bed-clothes for the patient's safety and comfort. Brief descriptions of the principal operations themselves are given.

We believe that this little book supplies what many probationers in eye-wards have desired. "A nurse thoroughly interested in her work," the author writes, "should not automatically use drops or applications simply because they are ordered, but should closely watch their effect on the cases." This is sound doctrine.

THE CONGRESS OF THE ROYAL SANITARY INSTITUTE.

WE reported at some length in our issue of August 1st the proceedings at the Congress of the Royal Sanitary Institute in Edinburgh, and we are glad to learn that its promoters consider it one of the most successful gatherings which the Institute has held. Sir George Newman's address, sketching the future of sanitary administration along the lines of unification and enlargement of sanitary units, co-ordination of the health services, and increased health education, was supported by the resolution of the Representatives of Sanitary Authorities, on the motion of Lieut.-Colonel F. E. Fremantle, M.P., for a unified health service, and many speakers supported the call for further health education of the public. Edinburgh promotes this spirit of public instruction by placarding her tramway stations with electrically-lighted health notices—"The M.O.H. says 'Spitting causes Disease,'" and the like, while Dr. C. S. Thomson (M.O.H. Deptford) told how his authority had asked him to give lectures on their policies and procedures, which he had found well attended. Expression was often given in the meetings of the Institute to the new outlook of preventive medicine, which aims to-day less at the direct reduction of mortality, and more at the reduction of disabling disease and at securing increased health and exalted resistance for the individual. Future advances, it is becoming felt, will depend largely on individual citizens by whom patient attention must be given to the laws of health.

The next Congress of the Institute will mark the jubilee of the Institute, which was founded in 1876; the meeting will be held in London on July 5th to 10th, 1926, under the presidency of the Duke of Northumberland, the opening meeting taking place in the Guildhall and the sectional meetings at Westminster.

ANIMAL PATHOLOGY AND PHYSIOLOGY.

ORGANISED research into animal diseases has been sleepy in its progress, but there are signs of an awakening movement. During the past year the Ministry of Agriculture's laboratory, the Institute of Animal Pathology at Cambridge, and the Animal Diseases Research Association at Glasgow, have all been actively engaged in the elucidation of puzzling factors in creature maladies. Braxy in sheep has always exacted a heavy toll in some districts and a vaccine is now being employed successfully against it. In 52,000 sheep which were inoculated, the death-rate was only one-quarter of that in untreated sheep. Lamb dysentery is another well-established disease, and persists so obstinately on some farms that the rearing of lambs has had to be given up. Mr. S. H. Gaiger, F.R.C.V.S., considers that the organisms which produce it are all "soil bacteria" and that the disease does not occur in the uterus of the ewe before lambing. This theory has been tested during the 1925 season, and the statistics of the Wellcome Physiological Research Laboratories, Beckenham, seem to indicate that inoculation of pregnant ewes with antigens made from the organisms isolated from cases of the disease has produced a decrease in the lamb fatalities. Scrapie and trembling or louping ill,

two distinct diseases of sheep, have also been investigated; but not much progress has been made with them, as both seem to be of obscure nervous origin and transmitted by tainted stock. Grass disease in horses and mammitis in cows and ewes have also received attention, and as time goes on much of the leeway in the domain of research in animal diseases will be gradually overhauled. The Institute of Animal Pathology has carried out a considerable number of routine examinations for veterinary surgeons during the year and is getting together a good library on animal diseases. Mr. W. A. Pool, M.R.C.V.S., late of the Indian Veterinary Service, has joined the research staff as senior research assistant. On the physiological side work has been no less interesting. The Rowett Research Institute, which was established as far back as 1912, near Aberdeen, for the study of animal nutrition, has issued a series of collected papers under the editorship of Dr. J. B. Orr, the director.¹ They cover a great variety of subjects, including the mineral metabolism of pigs and its relation to rickets; the respiratory exchange of goats; the water balance of the body; the nature of scrapie in sheep; the diet appropriate to the intensive raising of chickens; and many other topics of interest and importance. To anyone who likes browsing in a various collection of printed matter—and what genuine student does not?—the volume will make a strong appeal. It will remind him of the great difficulty of trying to keep track of any subject in the flood of present publications. For example, it is of obvious moment that those interested in respiration should consult the papers on the influence of external temperature, work, and pregnancy on the energy exchange of the goat. These, however, have not been published also in one of the physiological magazines, but only in the *Journal of Agricultural Science*, and we have to thank Dr. Orr for the dissemination of the information. We wish him and his colleagues all success in their second volume. Their work has a wider interest than the nutrition of farm animals.

THE NEW MILK AND DAIRIES REGULATIONS.

THE suspended Milk and Dairies (Consolidation) Act, 1915, will come into operation on Sept. 1st next. This Act repeals and re-enacts a number of provisions contained in the Contagious Diseases (Animals) Acts and the Sale of Food and Drugs Acts with regard to milk and dairies. It also reproduces a number of amendments and new provisions which were contained in the Milk and Dairies Act, 1914, the operation of which was deferred. Sections 1 and 2 extend the list of purposes for which Orders may be made under the Contagious Diseases (Animals) Act, 1878, and it is proposed as soon as possible to make an Order under the new powers. Sections 3, 4, and 5 contain provisions similar in effect to those contained in a number of local Acts for stopping the supply of milk likely to cause tuberculosis. Under the new Act the duty of enforcement is placed on the council of the county or county borough in which the cows are kept, and any Order made by them will prohibit the sale of the affected milk in any area. Section 4 requires the medical officer of health of the county or county borough to make the necessary investigations on receipt of a notice from any other medical officer of health. The Tuberculosis Order of 1925 providing for the slaughter of bovine animals affected with certain specified forms of tuberculosis and for the payment of compensation in respect of animals so slaughtered will come into operation on the same day as the Act, and it will be the duty of the local authority discovering the presence in a herd of a tuberculous animal to cause it to be slaughtered or to report the matter to the relevant authority for the appropriate action. Sections 6 and 7 re-enact provisions contained in the Sale of Food and Drugs Act, 1899. Section 8, in conjunction

¹ A limited number of copies is on sale at the Institute. Price 21s.

with Section 14, enlarges the power of the local authority to take samples of milk at any time before the milk is delivered to the consumer. An authorised officer of one authority may by notice require the officer of another authority to take samples of milk within his area under the Sale of Food and Drugs Acts, when the sample will be deemed to have been taken within the area of the officer giving the notice. Section 9 amends the provisions of the Sale of Food and Drugs Acts with regard to the warranty defence. Where such a defence is pleaded by a purveyor of milk a sample from a corresponding milking must be taken in the course of transit or delivery to the purveyor, and if the owner of the cows so requests, a further sample must be taken at the dairy at which the cows are kept. The warranty defence will not be available where the sample in respect of which the proceedings are taken is a mixture of milk obtained from more than one seller or consignor. Power is also given to the local authority of the district in which the first sample was taken to take proceedings against the seller or consignor. For the purposes of the new Act the expression "dairy" does not include a shop from which milk is not supplied otherwise than in the properly closed and unopened receptacles in which it was delivered to the shop. The information is set out at length in Circular 612 of the Ministry of Health, which may be obtained from H.M. Stationery Office for 1d.

GIOVANNI BATTISTA GRASSI.

ITALY has lost one of her most eminent sons by the death of Prof. Grassi in Rome last May. Born at Rovellasca, province of Como, in 1854, he graduated at Pavia in 1878 and occupied the chair of Comparative Anatomy at Catania until 1895, when he was called to the same position in the University of Rome, where he remained till his death. Pre-eminently a biologist, he was at the same time physician and naturalist. His own view was that the physician would do well to be something more of a naturalist and that the naturalist should not lose sight of the presence of man in his researches and analogies. Grassi's conception of the importance of the intimate connexions which existed between man and the rest of the animal world, connexions which consisted in identity or analogy of function, and in the adaptation of their life in common, led him to the outposts of a new science of which he was one of the founders and to which he gave the name of parasitology. The relations which the lower animals had with man, the specific adaptation in alternate hosts and parasitic cycles, the analogies between parasitic diseases in animals and man, revealed to him their great importance in pathology. Of this trend of study, which subsequently assumed immense and grandiose proportions and on which is founded the greater part of tropical medicine, he was a pioneer. In the preface to his work on Parasitology, which appeared in 1881, he wrote:

"I remember, when still a student and attending the course of general pathology, being often seized with an intense curiosity to know why the study of disease in every kind of animal was not included, and when I saw the pathologist endeavouring to reproduce experimentally human diseases in frogs and rabbits, I wondered why these and all other animals were not studied when they became diseased naturally. Even a limited application of Darwinism to pathology would suffice to illuminate us with a new and fruitful light."

Thus Grassi guessed at the future which was reserved for bacteriology; indeed, it might be maintained that circumstances alone prevented him becoming an Italian Koch. His scientific energies were directed into many and various fields of research and are a matter of surprise and admiration for all who are acquainted with his work. While still a student he discovered the ova of *Ankylostoma* in the faeces, he investigated the developmental cycle of *Strongyloides stercoralis*, and demonstrated that the dog's flea was the intermediate host of *Dipylidium*

caninum, that *Hymenolepis nana* had no intermediate host, while that of *Gigantorhynchus* was a beetle of the genus *Blaps*. From his researches on the *Helminths* were derived the fundamental conceptions which later on led him to the study of malaria and sand-fly fever. On these followed investigations on phylloxera, on the metamorphosis of the murenoids, and the constitution and development of the society of *Termites*, for which he was awarded the Darwin medal of the Royal Society of London, a series of researches any one of which would have secured his name to posterity. Working with Bignani and Bastianelli in 1898 on three species of mosquitoes, he finally concentrated his suspicions on *Anopheles claviger*, to the exclusion of *Culex* and other blood-sucking diptera, and in 1900 published his "Studies of a Zoologist on Malaria," in which Grassi placed on an impregnable foundation the doctrine that malaria cannot exist without *Anopheles*, the truth of which the universal experience of the last 25 years has confirmed. Eight years later the University of Leipzig conferred on him the honorary degree of doctor. To zoologists Grassi's name is very familiar because of his well-known work in association with Calandruccio, which first shed light upon the life-history of the common eel.

Grassi was a man of complex personality owing to certain qualities and even defects of character. Within a small and delicate frame, a wonderful example of the domination of mind over matter, he preserved a nervous and forceful will and a formidable capacity for work. In his laboratory from 7 A.M. till noon and from 1 to 8 P.M., with two or three hours' sleep and at work again before daybreak, such, even at an advanced age, was his constant habit, interrupted frequently by peregrinations into every part of Italy, often in his early days going on foot with his parcel of food in his pocket. He had derived a systematic precision from the schools of Gegenbaur and Bütschli at Heidelberg, and his marriage was a permanent link with Germany, but his genius remained essentially Italian. A man of large and clear ideas, not simply a specialist, but a focus of several specialties, he possessed the rare facility of changing quickly a mental attitude, of taking up a new point of view, of knowing how to free himself from the tyranny of an idea or an a priori conception. Even his prose had a marked personal style; he was not an elegant writer, but amid laboured and involved pages there were to be found terse phrases and sparkling epithets. He was full of strange contrasts, jealous of scientific fame, yet modest withal, and under a rough exterior concealing a simple good nature. He was an idealist in science; his ardour and even passion for work; his exactitude towards himself and others; his courage in exposing himself to dangerous experiments; his renunciation of everything except investigation and study, were fed by this sacred flame. His last wish expressed his philosophy of life: to be buried without public honours in a quiet cemetery in the Roman Campagna among the simple folk who were victims of malaria. This thought is emphasised in an admirable biographical notice by Dr. Massimo Sella,¹ which ends with the valediction: "Italians who are not forgetful will visit Thee in that lonely spot when they desire to strengthen their faith and their will, oh thou Great Italian."

Sir Charles Sherrington, P.R.S., Waynflete Professor of Physiology in the University of Oxford, has been appointed a member of the Medical Research Council from Sept. 30th next, in the vacancy caused by the retirement of Dr. Henry Head under the provisions governing the rotation of membership.

¹ Il Policlinico, Practical Section, July 5th, 1925.

BRITISH MOSQUITO CONTROL INSTITUTE.—The new building of the Institute at Hayling Island will be opened by Sir Ronald Ross on Monday, August 31st, at 4 P.M.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXV.—THE TREATMENT OF FLATULENCE

I.*—GASTRIC FLATULENCE.

FLATULENCE is a term applied to a collection of gas in the stomach or intestines in sufficient quantity to give rise to a sensation of fullness or even pain which is relieved when the gas is expelled. It may conveniently be considered according to its localisation in the stomach or intestines, its genesis being essentially different in the two situations.

Few symptoms are complained of so commonly as *gastric flatulence*, and certainly few are so misunderstood, a state of affairs due in large part to the persistence in medical parlance and literature of that mischievous term, *flatulent dyspepsia*. It will be well to emphasise at the outset that flatulence with very few exceptions is a symptom resulting from the habit of aerophagy or air swallowing, and that the fermentation theory, apart from rare instances, is a legacy of obsolete conceptions and has little more than historical interest to recommend it. Aerophagy is the cause; flatulence and eructations are its manifestations. A common courtesy amongst Mohammedan races, a gross breach of good manners in Western countries, a frequent associate of all forms of indigestion, and a visceral tic in an individual of neuropathic tendency, the results of aerophagy appear in so many and varied connexions that to maintain the term, *flatulent dyspepsia*, as a sufficient diagnosis is but to conceal the cause under the cloak of a prominent symptom. Under normal conditions the fundus of the stomach contains a variable quantity of air which is swallowed with the food and the saliva. This fundic air-bubble, so striking a feature of X ray examination, may be increased by: (a) deficient absorption of air; (b) fermentation or putrefaction of the gastric contents; (c) aerophagy or air swallowing.

Deficient Absorption of Air.

Deficient absorption of air from the stomach and intestines is a very rare cause of flatulence, but does occur at times as a result of chronic venous stasis in cirrhosis of the liver and cardiac failure. Treatment consists in the measures usually adopted for the relief of an embarrassed circulation, in the careful regulation of the diet, and in the exhibition of drugs to relieve the discomfort. It should be borne in mind that digitalis may not be well tolerated in cases of heart failure with prominent gastric symptoms and may, indeed, aggravate them. As regards the diet the general principles are: (1) that meals should be small and dry and not more than three in the day; (2) that the intervals between meals should be not less than five hours and that the principal meal should be taken in the middle of the day; (3) that fats and carbohydrates, with the exception of glucose, should be used sparingly. For the immediate relief of distension small doses of the carminative oils are undoubtedly useful, and as shown by Plant¹ act by increasing tone and contractile power. Saundby recommended the following combination:—

R. Tinct. zingib. fort.	..	..	10 ℥
Olei cinnamomi	..	..	1 ℥
Olei carui	..	..	1 ℥
Olei cajuputi	..	..	1 ℥

Dose 2—5 drops.

Oil of turpentine, 10—15 drops on a lump of sugar or in a capsule, is also of value, and a teaspoonful of powdered charcoal after meals is another well-tried remedy.

It should not be forgotten that to the flatulence of cardiac failure may be added the discomforts of aerophagy.

Fermentation and Putrefaction.

It is perhaps excusable for the layman to think that his food "may turn to wind in his stomach" and thus generate an apparently inexhaustible supply of gas, but such a view can no longer receive the serious attention of the medical profession nor be allowed further to obscure important issues. The rate of gastric emptying renders it impossible for flatulence to result from fermentation in the stomach apart from structural narrowing of the pylorus, and even in this condition flatulence is a somewhat rare complaint. The symptom may occur both in benign and cancerous stenosis and the eructated gases may be sour-smelling, putrid, or have the odour of sulphuretted hydrogen. Organic disease should be suspected whenever the eructations are malodorous, though, exceptionally, an odour may be imparted by oral or naso-pharyngeal sepsis. Investigation will speedily show the nature of the case and indicate the treatment proper to the condition, but as a temporary measure of relief and a useful preliminary to surgical procedure, frequent gastric lavage with hot water should be undertaken together with the oral administration of charcoal.

Aerophagy.

Aerophagy or air swallowing is, par excellence, the cause of flatulence. In moderation a feature of normal digestion aerophagy with consequent flatulence becomes abnormal under four main conditions.

1. As an unpleasant habit amongst those who bolt their food, or for other reasons are unable to masticate it sufficiently.

2. As a sequel to excessive salivation or sialorrhoea. This may result from oral or naso-pharyngeal irritation. Ryle² produced aerophagy in himself by painting the pharynx with an iodine preparation. Dental caries, pyorrhoea, neglected dentures, tonsillitis, naso-pharyngeal catarrh, and more rarely oesophageal cancer are well-recognised causes.

3. As a symptom in those whose main complaint is indigestion. Flatulence may accompany any type of dyspepsia, whatever its cause, and irrespective of any abnormal conditions of gastric motility and secretion. The mechanism of aerophagy in these cases is described by Hurst³ as follows: "The patient feels some slight discomfort in the stomach, which he thinks is due to 'wind' and which he hopes he will be able to 'disperse' by eructation; as there is really no excess of gas present, the attempt proves unsuccessful and results in the swallowing of air. After half a dozen attempts have been made, air being swallowed on each occasion, the stomach becomes so distended that an attempt is at last successful." As Bennett⁴ points out, the habit is acquired so gradually and unthinkingly that the patient is usually unaware of it until it has been brought to his notice. Although flatulence may occur with dyspepsia from any cause, its association with gall-bladder disease is often so striking as to have some diagnostic value.

In this connexion it may be noted that Bennett⁴ has recently drawn attention to the extremely important rôle played by aerophagy as a cause of post-operative acute gastric dilatation.

4. As a psychoneurosis. In patients of neuropathic tendency, as a result of fear, anxiety, or other morbid obsession, aerophagy may occur as a habit and should

* An article on Intestinal Flatulence will appear in this series next week.

¹ Plant: *Journal of Pharm. and Exp. Therapeutics*, vol. xvi., 311.

² Ryle, J. A.: *Goulstonian Lectures*, THE LANCET, March 28th, 1925.

³ Hurst, A. F.: *Medical Essays*, London, 1924.

⁴ Bennett, T. Izod: *Diseases of Stomach*, London, 1925.

be regarded, according to Hurst, as a visceral tic, but it is probable that here, too, the aerophagy had its origin in some gastric discomfort long forgotten. This type of patient presents a familiar appearance; his face is a mirror of his mental and abdominal unrest; he lives on the atmosphere, and his resounding gusty eructations are a source of grave perplexity to himself and mingled astonishment and dismay to his friends and neighbours. In such a one the air does not enter the stomach but is drawn into the oesophagus and immediately and violently expelled. Excessive salivation may be a contributory factor, whilst cardiac symptoms such as palpitations, tachycardia, arrhythmia, and pseudo-angina may occur and make his distress the more acute.

Treatment of Flatulence Due to Aerophagy.

The aims in treatment will be three: (1) To search for and if possible remove the cause. (2) To treat the aerophagy. (3) To treat the flatulence resulting from it.

1. In all cases where the main complaint is of indigestion a careful investigation, by the usual methods, of the upper alimentary tract is essential, for as Bennett⁴ says, an organic cause must not remain concealed by such camouflage as flatulent dyspepsia. In a word, the investigation of these cases is that of a dyspeptic and the treatment will vary according to its results.

2. When the symptom is so obtrusive as to demand treatment apart from its underlying cause, it becomes necessary to treat the aerophagy itself. When possible an emphatic assurance as to the absence of gross disease should precede a careful explanation of the mechanism of air swallowing supported, if need be, by a personal demonstration. The patient must be told to suppress all desire to eructate, since no one ever has or ever will be able to bring up wind voluntarily, and any efforts in this direction will but result in the swallowing of air. In the majority of cases explanation on these lines is readily accepted and is usually all that is requisite to break the habit, but in obstinate cases the patient may be advised to hold some small object, such as a cork or cigarette-holder, between the teeth after meals or he may wear a tight band or collar around the neck to act as a constant reminder of his habit. Meals should, in the main, be dry, since less air is swallowed with solid than liquid food, and should be eaten slowly. Excessive salivation when of purely nervous origin should be treated with belladonna, and the bromides may be added for their general sedative effect. In hysterical patients the passage of a large-sized stomach-tube and its maintenance in position for half an hour may be tried, the patient being informed that this procedure will cure the condition. In cases of exceptional severity where the flatulence is no more than a prominent manifestation of a generalised psychoneurosis complete isolation combined with psychotherapy is desirable.

3. The drug treatment of gastric flatulence is of quite secondary importance, but for the immediate relief of discomfort the carminatives are valuable and in view of Plant's work their use is rational. They have already been referred to.

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EXTENSION OF HAMPSHIRE COUNTY HOSPITAL.—

A comprehensive scheme for the improvement and extension of this hospital, the first instalment of which will cost £55,000, has been set on foot by a county meeting at Winchester. The nurses' home is to be extended at a cost of £26,000; an isolation block and a new out-patients' department are also to be provided. At present 21 nurses are housed in a worn-out army hut; another 27 live in houses outside the hospital, with the consequence that last winter many of them suffered from colds and sore throats. The hospital was founded as long ago as 1736.

Special Articles.

SOME GENERAL REFLECTIONS ON PUBLIC HEALTH ADMINISTRATION.

By J. H. L. CUMPSTON, M.D. MELB., D.P.H. LOND.,
DIRECTOR-GENERAL OF HEALTH, COMMONWEALTH OF AUSTRALIA.

IV.—THE PROPOSED FAR-EAST CONVENTION.*

THE draft Convention, submitted by Dr. Norman White to the League of Nations as a considered proposal for the regulation of Port Health Organisation and procedure in the Far East, challenges serious examination, because Dr. White has appreciated the difficulties known to exist by all engaged in quarantine activities, and he has dared greatly in departing from the beaten path in his endeavour to find a remedy.

In Australia the conditions in the past have been such, and our present problems are so nearly related to those with which the report deals that we can feel well-disposed to Dr. White's attempts even if we cannot accept his draft Convention. We have been sorry that he could not visit Australia, as we feel we would have benefited from his vigorous outlook, and perhaps our 50 years of evolution in matters of quarantine might have provided precedents of legislative form of some assistance to him in his work. While Australia may not be generally recognised as a country in the Far East, it is only five days steam from Batavia to Darwin, and three days from Banjoewangi to Broome. Also there is continuous traffic down the coast, so that steamers from infected Asiatic countries travel from one Australian port to another within and beyond the incubation period of each of the diseases dated from the infected Asiatic port. Moreover, as Australia is entirely free (except during epidemic invasions) of these diseases, the epidemiology—i.e., the maritime epidemiology—of these diseases can be studied under conditions exceptionally free from complicating factors.

It is therefore perhaps justifiable to apply our experience in an attempt to discuss this draft Convention in the light of the forthcoming official revision of the International Sanitary Convention.

A. The Draft Regarded as a Convention.

Dr. White would probably be the first to admit that his draft requires some re-casting before it could be adopted as a legal document. The various points which seem to call for comment are as follows:—

(a) Certain expressions of loose form require reconsideration as to form alone, omitting for the moment any discussion of their significance:—Para. 11: "Measures shall be taken at the port of departure . . . in so far as these are practicable." Para. 18 provides that an inspection is to be made by a health officer immediately prior to the vessel's departure and this examination shall ensure that the vessel is mechanically clean in all parts prior to storing cargo or receiving passengers, and no communication with the shore shall be permitted after the completion of this examination. The paragraph says this, although it does not mean this.

(b) A Convention is a binding legal agreement by which every signatory country undertakes to adopt the procedure therein prescribed. The essential nature of a Convention excludes the concept of an ulterior power exercising jurisdiction or compulsion over the individual signatories. Despite this basic principle, the Convention contains internal evidence of the presumption of such a power. Para. 4 provides that ports shall be classified into three categories according as they possess or do not possess "qualified and adequate health staff," "adequate apparatus for fumigation," "suitable quarantine station," and other things "safe" or "adequate." The draft Convention leaves mysteriously undetermined the identity of the authority who shall determine the "adequacy" and so "classify the ports." But the preamble definitely states that "it would be advisable to leave the classification of ports to a central international epidemiological bureau."

Putting aside all questions of the authority controlling this bureau, and the acceptability to various countries of

* Parts I., II., and III. appeared in THE LANCET of July 11th and 25th, and August 1st respectively.

such external determination of fundamental data on which quarantine operations are based, it is essential for a Convention that the nature of the classifying authority and the scope of its functions be specified in the body of the Convention. Para. 16: It is provided that the measures which shall be taken with regard to small-pox shall follow the procedure in Article 36 (of the proposed modification of the International Sanitary Convention) except that all the measures "shall be compulsory and not optional." The proposed modification provides that "it is recommended that the following measures shall be adopted." Dr. White's suggestion would, if adopted, involve for each country an obligation to carry out the prescribed measures under compulsion, presumably by some authority having power to compel. Dr. White probably means that each country should agree that the measures proposed should be enforced. This criticism is not over-meticulous, as Dr. White submits his text as a legal instrument fully prepared for insertion in the text of the Convention. The phraseology of para. 16 (d) would probably require some revision before it could be incorporated (if accepted in principle) in the text of a Convention.

B. Basic Principles of the Draft Convention.

The principal considerations which seem to have inspired Dr. White are stated in his preamble to the draft Convention. These are:—

(1) The importance of the human being in relation to plague-transmission is exaggerated in the International Sanitary Convention.

(2) The sanitary state of the port of departure should not be ignored to the extent permissible under the International Sanitary Convention.

(3) The action to be taken on arrival of vessels should be based on the sanitary state of the port of departure rather than on the condition of the vessel, and there is no necessity to classify ships as infected, suspected, and healthy, as is done in the International Sanitary Convention.

It is likely that Dr. White will find considerable agreement with these principles, even amongst those concerned with the drafting and revision of the Paris Convention of 1912. Probably the best way to discuss the practical application of these principles is to begin by considering a vessel newly arrived in port in a country free from the diseases in question. But before doing so, it may be permissible to point out that in all of the discussions of maritime quarantine the lessons of maritime epidemiology have been almost ignored and the facts of terrestrial epidemiology have been assumed to apply. All experience shows that maritime epidemiology has principles and laws of its own, and these laws should be studied much more completely than they have been hitherto.

A vessel on arrival at a clean port presents a problem for immediate solution. There are two elements in the problem: (a) Whence does this vessel come; (b) what has been, and is, her sanitary condition. Dr. White divides ships into infected or non-infected. An infected ship is one on which a case of one of the diseases in question is present or has occurred during the current voyage. (A curious omission is the lack of specific reference to rodent plague unaccompanied by a "case" of human plague, cf. paras. 16 (a) 1 and 3.) A non-infected ship is one which is not or has not been infected in the above sense.

Infected and Non-infected Ships.

Dr. White does not use these terms "infected" and "non-infected," but they are necessary for discussion.

(i.) *The Infected Ship.*—The measures proposed by Dr. White for dealing with the infected ship do not differ essentially from those in the proposed revision of the Paris Convention, except that the "suspected ship" disappears and all vessels which have been infected during the voyage are regarded as infected. As a theoretical principle this commends itself as quite sound; but on examination the Paris Convention provisions commend themselves as equally sound and the distinction between "infected" and "suspected" is a matter of convenient classification. If Dr. White had to deal with a vessel arriving at a port with cases of plague on board he would: (a) inspect all on board; (b) disembark and isolate the sick and pay special attention to all who had been in contact with the sick; (c) disinfect bedding and quarters; (d) deratise the ship.

If, on the other hand, the vessel has no case on board and has had no fresh human case for seven days, he could not isolate the sick and he would, on his own showing, not

consider it necessary to isolate contacts, but all the other things he would do. This procedure is precisely what the Paris Convention prescribes. The same is true of cholera and yellow fever.

There is, therefore, no force to the proposal that the class of "suspected" ship should disappear. It is artificial, certainly, but it is a convenient way of detailing the difference in measures applied to: (1) a ship which arrives in port with fresh cases, and (2) the ship which has had only an isolated initial case during the voyage. As a practical matter the difference is that between the vessel which has embarked a passenger or member of the crew incubating plague or cholera and the vessel which apparently has a source of infection on board or a spreading infection from the initial case.

(ii.) *The Non-infected Ship.*—Dr. White first proposes (para. 15) that "cognisance" shall be taken of: (a) ships from infected or suspected ports; (b) infected ships from clean ports; (c) ships from clean ports carrying plague-suspectious or cholera-suspectious cargo from infected localities.

From the point of view of daily routine administration this proposal is incomplete. It assumes that Governments will take no cognisance of other vessels. Let us take an actual case. A vessel left San Francisco, which at that time was neither "infected" nor "suspected" with small-pox. It carried some passengers from the interior of the United States incubating small-pox. The vessel called at Honolulu, Suva, Auckland, and arrived at Sydney. The surgeon did not report small-pox. If the Government of Australia had taken no cognisance of that ship the cases of small-pox would never have been known, having been missed at the other ports. It is therefore necessary that a special distorted significance be given to the word "cognisance," or else that some other formula be devised permitting of the routine medical inspection of all overseas vessels arriving. The Paris Convention assumes this, and the Quarantine Act of Australia specifically provides for it and covers all of Dr. White's groups. In the Australian Act all overseas vessels (and in the event of an internal epidemic all vessels from the infected area) are "subject to quarantine"; all "infected" vessels (in Dr. White's sense) are "ordered into quarantine" and then dealt with according to the "suspected" and "infected" procedures of the Paris Convention; and all clean ships from "proclaimed" ports (which are Dr. White's infected and suspected ports) and their cargo or water-tanks are dealt with in accordance with the recognised procedure in each case.

Vessels on Arrival.

Dr. White's introduction leads the reader of his report to expect that he will introduce into his proposed procedure for dealing with vessels on arrival at any port some reduction of completeness depending upon the action taken at a first or second class port of departure. But the only reference to this is found in the preamble: "leaving the port health officer to determine the facilities and immunities that would be accorded vessels that had been treated adequately before departure from ports of the first or second class." Further, there is para. 18, in which it is proposed that a health officer shall inspect all vessels leaving an infected port of the first or second class. Quite apart from the anomalous position that a health officer will not know in any week until the next Saturday night whether his port is infected or not, it is interesting to examine the significance of this classification. The difference between ports of the first and the second classes is the possession by the former of fumigation apparatus and a quarantine station. It is not clear what effect the possession of a quarantine station, with a capacity of 500 passengers and crew, at a port is to have on the risk to overseas countries in view of the present obligation under the Paris Convention on the competent authority to prevent the embarkation of all persons liable to transmit infection.

The pre-occupation of each Government is the protection of its own people from imported disease. A Government in Europe or Australia is concerned only that a vessel approaching its shores shall have left an infected country in a clean condition. This is already covered by Article 12 of the Paris Convention and its achievement is fully possible without a quarantine station; for this purpose, and, in fact, for all the purposes of Dr. White's draft Convention, a port might well be classed as first class without a quarantine station, provided the port of disembarkation were so equipped. Here lies, possibly, the true

purpose of Dr. White's proposal—viz., that some form of inducement is necessary to encourage all important ports in the Far East to provide themselves with a quarantine station and other essential equipment. Nobody with any experience will do other than applaud this purpose, but it is brought into the Convention in an illogical and resultless manner. Actually, so far as one can read the report, the design is that the "central epidemiological bureau" shall be in a position to encourage by moral pressure the establishment of such stations. That is a larger issue with many implications direct and indirect. It is sufficient to say here that such a design cannot be introduced in a subtle and indirect way, but must, if adopted, find clear and definite expression in legal form in the text of the Convention.

Vessels on Departure.

A very important practical provision, which might with advantage be incorporated in the International Sanitary Convention, is found, but in very tentative form, in para. 21 of Dr. White's draft Convention. This article reads as follows:—

"With regard to other communicable diseases not coming within the scope of articles in this Section, each signatory Government shall endeavour to apply to departing vessels such measures as may be requested by the Government of the country of the port of destination."

To a certain extent this practice is recognised in the Australian Quarantine Act and Regulations, at least to the extent that exemption from deratisation measures is permitted if these have been effectively carried out according to prescribed means at an overseas port of departure. The same provision has been utilised in connexion with cholera, if the water-supply at an overseas port has been from a reliable source. In Dr. White's report, however, the position is left unsatisfactory in that the same basis of action is dealt with partly by Article 18, which provides for inspection by a medical officer at the port of departure, and Article 16 in which the reduced measures of protection at the port of arrival are based upon action of the kind now contemplated at the port of departure.

The Dutch Government has submitted to the Health Committee of the League of Nations a similar suggestion. In Holland the Government is authorised to exempt vessels going from one port from any health formalities before entering another port provided all necessary measures of disinfection, deratisation, &c., had been taken at the first port; the Dutch Government think that, from an international point of view, it would be highly desirable to extend the scope of this measure in the interests of commerce. This proposal was the subject of some discussion, and it was decided to entrust to a Commission the task of studying the practical measures necessary to facilitate the conclusion of agreements between Governments, aiming at the establishment of this procedure on a standard of scientific basis. It would probably be found that there is uniform agreement as to this principle of bringing into operation the protective measures against the transmission of disease at the point where the risk actually exists. It is merely the expression in another administrative field of the military principle that the best defence line is the enemy's frontier.

When bubonic plague occurred in Brisbane and Sydney, 1922-23, the immunity of the other portions of the Commonwealth from plague was due entirely to the fact that such measures were taken as to ensure the departure from the infected areas in an entirely rat-free condition of every single article of merchandise.

Progress Necessarily Slow.

Undoubtedly international sanitary measures will be improved from their present basis in proportion as measures of sanitary precaution can be taken in regard to traffic at the time of departure from the infected country, and each modification of the Sanitary Convention aiming at securing this result, step by step, would be hailed as an improvement. The prospects

which we now have of securing the inclusion of a logically considered scheme of action in this regard in the next revision of the text of the Sanitary Convention represent one of the greatest advances which has been made during the evolution of the sanitary conventions. It is felt, however, that tangible results in this direction will be slow to materialise, as each port, in order to secure recognition, will need first to provide proper equipment, and second, to establish the confidence of other countries that the equipment is reliable.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 226.)

THE COUNCIL OF BRITISH OPHTHALMOLOGISTS.

(App. LXIII. and Q. 17772-17934.)

EVIDENCE on behalf of this Council was submitted by the following medical men: Mr. E. Treacher Collins, Mr. J. Herbert Fisher, and Mr. S. Mayou.

The Council is strongly of opinion that the examination of the eyes should be carried out by qualified medical practitioners, and supported its view by drawing attention to the report of the Departmental Committee on the Causes and Prevention of Blindness, in which the importance of the provision of adequate facilities for ophthalmic treatment is emphasised, and a definite recommendation made that "all persons with defective vision should first consult a competent medical practitioner."

A subcommittee of the Council jointly with the British Medical Association have made recommendations which include the following:—

1. That the so-called optical benefit should be designated ophthalmic benefit. Ophthalmic benefit would include examination and prescription for spectacles, if required, and such operative treatment and advice as can be given at a single consultation at the consulting room. A report, when necessary, would be given for the guidance of the private practitioner.

2. That insured members of every Approved Society should in any case of ocular disorder or visual defect apply to their insurance practitioner.

3. If the insurance practitioner considered the case one requiring special advice or treatment he would give the applicant a certificate, enabling him to consult a specialist at a reduced fee.

4. A list of ophthalmic medical practitioners qualified and willing to see members of Approved Societies at a consultation fee of £1 ls. should be prepared.

The Council considers that no course of training short of that required for full medical qualification can produce the skill and judgment necessary for the examination and treatment of the eyes. It is well known that changes in the refraction of the eye are often produced in the early stages of serious eye disease. In many such cases an optician may be successful in raising the acuteness of the vision to a normal standard, but he would almost inevitably fail to recognise the disease which is the cause of the refractive error. In fact, disease very serious to the eye, or threatening even life, may occur in an eye with perfect acuity of central vision.

Without the use of drugs to dilate the pupil or paralyse the focusing muscle, in many cases the optician cannot measure accurately the error of refraction, or be in a position to identify the cases which demand medical advice and treatment. If he were allowed to use such drugs he would become an even greater danger to the community by reason of serious disease which he in his ignorance might produce. The ophthalmic surgeon must have an adequate knowledge of diseases of the brain and

* References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

central nervous system, of the blood-vessels and vascular system, of the kidneys, of the nose and its accessory sinuses, of the various ductless glands, &c. In fact, there is no branch of medicine which is not in close relationship with this special domain, nor is there any specialty in which a general medical knowledge is of greater importance.

On the question of the competence of the general practitioner to make an effective examination and diagnosis Mr. Fisher said:—

(Q. 17779.) Our idea was, I think, that the panel practitioner would be a cog in the wheel of administration of ophthalmic benefits, probably not actually doing himself any large proportion of the ophthalmic benefit, but here and there, there might be a panel practitioner who might have sufficient special knowledge to deal, at any rate, with some branches of ophthalmic cases. That would not be very frequent.

This led later to the following question:—

(Q. 17864.) Does it not simply resolve itself into this, that in a very large proportion of cases the general medical practitioner would be bound to say, and quite honestly bound to say: "This is beyond me altogether; go to an ophthalmic surgeon"; and that would involve a fee of a guinea in every case?—In a large majority of cases, certainly.

As to there being a sufficient supply of specially trained practitioners for a service for the whole insured population, the witnesses stated that a list had been drawn up jointly with the British Medical Association, and there was a sufficient supply for present needs and no doubt that the number would rapidly increase.

The witnesses agreed that the training of the general practitioner in eye work was quite inadequate, and the Council has repeatedly made representations on the subject to the General Medical Council. The Council was in possession of evidence of the danger of a patient going straight to the optician, the mistakes including overlooked disease, patients unnecessarily alarmed about their condition, and unnecessary glasses frequently supplied.

With regard to clinics, the witnesses said that if any clinic system were to be established it would have to be independent of the present eye hospitals, where it would be physically impossible to get through the cases in the accommodation available, but, in fact, the Council were opposed to clinics generally and regarded them as impracticable for the treatment of the insured population.

THE OPHTHALMIC BENEFIT COMMITTEE.

(App. LXIV. and Q. 17935-18029.)

This evidence was given by the following medical men: Mr. H. L. Eason, Mr. G. H. Pooley, and Dr. Charles F. Harford.

The Ophthalmic Benefit Committee represents the interests of ophthalmic medical practitioners who are willing to take part in an Ophthalmic Medical Service. The Committee is in hearty agreement with the evidence submitted by the Council of British Ophthalmologists and the British Medical Association. The Ophthalmic Benefit Committee came into existence about a year ago. Its membership is approximately 280, excluding the North of England, which has its own society, represented on the Committee by Mr. Pooley.

The witnesses confirmed the evidence given above as to the dangers arising from going direct to the optician, and said that the cases which they could produce in evidence involved both trained and unqualified opticians.

(Q. 17953.) Will you give us briefly some indication of the nature of the cases?—The common disease is glaucoma which, as you know, is one of the serious diseases which may affect the eye. Early cataract is another. Disease of the retina associated with some general medical disease such as renal disease and Bright's disease, which are apparent to any skilled observer and are only local indications of general disease.

They objected strongly to some of the advertisements of opticians, by which they considered that the public were misled. The optician might examine

the inside of the eye through a lens, but without medical training he could not appreciate the importance of what he saw.

(Q. 17972.) By looking at the inside of the eye you have the opportunity of seeing a portion of the human body during life under a high magnified power. Arterial disease, nervous disease, many other diseases, can be seen in the eye before being recognised elsewhere.

Interesting evidence was given with regard to cases of hæmorrhage in the retina productive of headache and yet easily overlooked in a mere testing for glasses. It was suggested by a member of the Commission that this appeared to prove too much and to lead to the conclusion that people should go to the ophthalmic surgeon at intervals. The witnesses agreed that these cases would not necessarily be discovered by providing that persons should go for correction of error of vision to an ophthalmic surgeon rather than to an optician. Mr. Harford explained the matter as follows:—

(Q. 17980.) People are being persuaded by these specious advertisements that if they have a headache, if there is discomfort in various ways, they should not go to their doctor, but to an optician. If they had gone to their doctor he would have been able to throw more light on the other symptoms. People seldom have hæmorrhage of the retina without some other symptom, and, therefore, all things have to be discovered, and the right person to do this is the patient's own medical practitioner who is dissatisfied with their state of health, and feels that they ought to have further advice, which would mean an examination by an ophthalmic surgeon.

With regard to clinics, the grave defect was felt to be that it was a contract system whereby so many persons had to be seen in an afternoon whether the cases were important or not; the Committee thought that specialists would never be persuaded to take up clinic treatment under the Insurance Acts, though in reply to later questions bearing on the possibility of an improved and better organised system of clinics, Mr. Eason said:—

(Q. 18029.) In addressing ourselves to the fundamental question, the question of clinic or no clinic is to us of secondary importance compared to the main point, which is giving to the insured person when he goes to the clinic or anywhere else the best possible attention. If the first point is accepted then we can work out the machinery.

CHEMISTS' EVIDENCE.

(App. LXV and Q. 18030-18265.)

Mr. A. R. Melhuish and Mr. G. A. Mallinson gave evidence on behalf of the Retail Pharmacists' Union, which was founded to carry on, in addition to other activities, certain work, formerly undertaken by the Pharmaceutical Society of Great Britain, which, as the result of a test case in the High Court, was deemed to be outside the Society's charter. The membership of the Union is limited to those carrying on retail businesses as chemists, and it represents the whole of the panel chemists of the country through the Pharmaceutical Committees, all of which acknowledge the Union as the representative body. Scotland has its own separate organisation and the evidence related to conditions in England and Wales.

Under the National Health Insurance Acts prescribing is separated from dispensing excepting in many rural areas where the doctor necessarily does both. The chemist has no control over the supply, it being his business to meet the requirements of the doctor's prescriptions.

The arrangements under the National Health Insurance Act for the supply of medicines through the chemists are, it was stated, as complete as any which exist in private practice, and are a vast improvement on the conditions previously existing under the "club" practice system. The insured person can now have exactly the same medicines as the most wealthy patient can purchase. He has the right to the same range and quality of drugs and medicines. The doctor is the deciding factor, and whatever he orders the patient will get from the panel chemist.

The arrangements work well and there is a supply of chemists adequate to maintain a service for the dependants of insured persons. It was suggested that the separation of prescribing from dispensing is a natural result of the developments in medical science. The doctor has now no time to spare to make himself a specialist in pharmacy and dispensing. An advantage upon which too much stress cannot be laid is that the doctor may prescribe during his rounds and the patient can get the medicine without waiting for the doctor to return home, because the chemist gives a continuous all-day service. Further, the fact that a patient can be dismissed immediately his prescription has been written lessens the congestion in doctors' waiting-rooms. The hospital practice of using stock mixtures is not viewed favourably by chemists, who maintain that the tendency should be in the other direction, towards the higher-class medical practice of writing individual prescriptions.

With regard to delays that may occasionally arise in making up prescriptions, it was thought that there might be closer co-operation between Panel and Pharmaceutical Committees in regard to surgery hours and the hours of closing chemists' shops.

As to the checking of medicines supplied by chemists, the witnesses said that the machinery of the Food and Drugs Act had not proved fair or effective. The chemists were themselves desirous of adequate tests being made and of proper disciplinary action, and the Retail Pharmacists' Union had submitted a scheme to the Ministry of Health. In general the scheme provides for medicines being made up by the chemists on prescriptions specially written by the doctors and presented by an agent of the Insurance Committee, who proceeds to divide the medicine in the presence of the chemist and takes one-half away to be analysed. The doctor does not write these special prescriptions because he is under contract to do so, but because it assists in promoting the efficiency of the service. For what they described as manipulative error, the witnesses thought that an all round 5 per cent. margin should be allowed.

On the subject of advice asked for by customers, the following questions were answered:—

(Q. 18205-8.) You mentioned that people come to you for general advice. I suppose about a cut finger and things of that sort?—Yes. And you advise them?—Yes. In a certain sense you act as medical advisers in a small way? Hardly that. You act as a layman with a knowledge of medicine?—It is what you would do in your own family.

It was claimed in the course of examination that as between chemist and client there was something of the same desirable personal relationship which counts for so much as between doctor and patient and that in any case it was clear that a person thought much more of medicine supplied by the chemist than he did of supplies from a dispensary or the out-patient department of a hospital.

DRUG STORE PROPRIETORS.

(App. LXVI. and Q. 18266-18436.)

This evidence, given by Mr. W. Huntrods and Mr. A. Hutchison, contains statements of a rather sweeping character suggesting unnecessary services rendered by doctors to insured persons and fraudulent practices on the part of chemists, such as the alteration of prescriptions for their pecuniary benefit, and the supplying of short measures and inferior articles—statements which the witnesses had not the material necessary to support in oral examination.

Other statements were as follows: Persons earning more than £100 per annum should not be compelled to be insured because they are generally of a higher education and social standing than the average working man. . . . The administration of medical benefit should be simplified by establishing State medical officers and dispensaries. . . . There is not the slightest doubt that the National Health Insurance Act has created a neurotic drug-loving nation. . . . Careful consideration should be given to (1) repeal of the Act; (2) the taking of a plebiscite; (3) making the Act voluntary.

BRITISH PHARMACEUTICAL CONFERENCE.

GLASGOW, JULY 27TH-31ST.

THE sixty-second annual meeting of the British Pharmaceutical Conference was held at Glasgow during the last week in July. Mr. Edmund White, B.Sc., F.I.C., the chairman, in his address, dealt with recent and coming events in British Pharmacy.

Chairman's Address.

Mr. White began by referring to the progress that has been made with the scheme for establishing a laboratory for the biological examination and standardisation of therapeutic substances; rooms in the Pharmaceutical Society's buildings had been allocated for the laboratories, and with the passing into law of the Therapeutic Substances Bill, the Society will be able to meet the demand for an institution which will be competent to examine and issue certificates for therapeutic substances requiring standardisation by biological and physiological methods. There is no doubt that such standards will receive extended recognition as and when facilities are provided for their establishment and they are shown to be reliable indications of value and potency. Mr. White next referred to the recent remarkable growth in the membership of the Pharmaceutical Society and then to the prominent part the Society is now taking in international pharmacy, and the steps lately taken towards the advancement of pharmaceutical education and research at home. In this latter connexion he mentioned the establishment this year of the degree of Bachelor of Pharmacy, instituted by London University under conditions which will enable the Society to accept it as a registrable qualification, and the raising of the standard of the curriculum and examination for the qualification of pharmaceutical chemists. The fact that London University has recognised pharmacy as a branch of learning necessitating the provision for facilities for the highest form of education and research will do much to place pharmacy in its proper relation to the other sciences. Finally, Mr. White, after referring to the difficulties in the way of the international unification of pharmaceutical methods, said he believed that a serious effort to unify pharmacy in the English-speaking communities would yield encouraging results at once: "You have only to compare the British Pharmacopoeial Codex with the United States Pharmacopoeia to see how British and American practice runs on similar lines, and the time has now arrived when our great overseas Dominions, such as Canada, Australia, New Zealand, and South Africa, should be invited to take a more active share in moulding the destinies of pharmaceutical practice as reflected in our Imperial and National Pharmacopoeias."

Scientific Papers.

In the Science Section 19 papers were contributed, some of them being of a high standard and bearing evidence of patient work. In a paper on the Identification of Alkaloids, W. M. Cumming, D.Sc., F.I.C., and D. Brown, B.Sc., described how, using potassium ferro-cyanide as a reagent, the alkaloidal salts in definite crystalline form may be obtained from neutral, acid, and alcoholic solutions. The paper was copiously illustrated by lantern-slides, showing the characteristic appearances of the crystallised salts. H. Finemore, B.Sc., F.I.C., read a paper on West Australian Sandalwood Oil, in which he suggested that this oil may prove to be as efficacious medicinally as the East Indian oil. There seems to be little, if any, reason why the B.P. specification for sandalwood oil should not be made to include the West Australian product. A. J. Jones gave the results of his investigation of the question of the

variability of the density of bismuth carbonate; incidentally he remarked that it was a mistake to suppose that a light carbonate always suspended or diffused better than a heavy one. A typical pharmaceutical paper was contributed by F. J. Dyer and R. Melville on Phosphorus Pill; the official formula produces a pill that is too soft for general practice, and the authors, while presenting a new formula, suggested that the administration of free phosphorus in pill form should be replaced by some other method, as, for instance, phosphorated oil in capsules. A communication from the Pharmaceutical Research Laboratory of the Pharmaceutical Society was made by T. E. Wallis, B.Sc., F.I.C., and Ellinor J. Mowat, on true and false *santonicas*; from time to time there appear on the market specimens of *santonica* which closely resemble the genuine drug in external appearance, but which contain no *santonin*. The examination of a large number of species of *Artemisia* belonging to the section *Seriphidium* enabled the authors to select those features which are useful in distinguishing between nearly related species and to formulate characters by which the flower heads of genuine *santonica* of commerce can be identified with certainty. Another communication from the same laboratory was made by G. R. A. Short on the structure of *coscinium*; these two papers illustrated the valuable research work which is being done in the Pharmaceutical Society's laboratories. A paper of more direct interest to practising pharmacists was contributed by G. T. Elsdon, B.Sc., F.I.C., on the testing of insurance dispensing; he made observation on 309 mixtures, dispensed under the Insurance Act, which he had examined and showed that in recent years adulteration was almost entirely absent; incidentally, he mentioned that it was now possible to obtain machine-made bottles having an accuracy of about 2 per cent., in all cases. Bernard F. Howard, F.I.C., and Oliver Chick drew attention to two minor discrepancies in the quinine monographs of the British Pharmaceutical Codex; their comments will be of assistance to the Revision Committee. In a paper on the estimation of small amounts of reducing sugars in urine F. Wokes, B.Sc., drew attention to the importance of carrying out accurate estimations of small amounts of reducing sugar in urine and suggested a micro-method for use by pharmacists; he also showed how to make allowance for variations in urine due to diet and the time of collection of samples.

Among other papers contributed were the following: A Chemical Examination of the Oleo-Resin of Indian Valerian Root, by K. Bullock, M.Sc.; the Identification by Chemical Methods of Drugs Containing Tannins, by A. H. Ware; Cochineal: the Utility of Assay Methods in the Estimation of Comparative Colour Values, by A. O. Bentley and S. Meakin; Note on Morphine Hydrate, by D. B. Dott; the Pterates of the Opium Alkaloids, by C. W. Maplethorpe and N. Evers, B.Sc., F.I.C.; the Colorimetric Estimation of Benzoic Acid in Cordials, by A. J. Jones; A Note on the Official Process for Assaying Galenicals of Hydrastis, by H. B. Mackie and H. A. Cleary, B.Sc.; A Note on Oleated Mercury, by F. J. Dyer and K. M. Metcalfe; the Vitamin Content of Cortex Limonis B.P., by S. G. Willmott, Ph.D., B.Sc., and F. Wokes, B.Sc.

At a meeting of delegates from the Pharmaceutical Society's branches, held in connexion with the Conference, under the chairmanship of Mr. P. F. Rowsell, President of the Society, a paper was read by Mr. F. Pilkington Sargeant entitled *An Historical Survey of the Charters and Acts of Parliament Governing the Society's Activities leading up to the Present-day Position*. Mr. J. Keall read a paper on the Dangerous Drugs Act. A meeting of the newly-formed League of Ex-Service Pharmacists was also held under the chairmanship of Major E. S. Peek. Papers were contributed on the Development of Pharmaceutical Service in the Army, by Captain Hill, and on the Use of Antiseptics in War, by Mr. F. Wokes.

CANADA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Montreal Vital Statistics: A New Milk By-law.

Dr. Boucher, Director of the Health Department of Montreal, has issued recently the annual report of his department for 1924, in which the vital statistics of Montreal are discussed. These show that there has been, compared with 1923, a decrease in the death-rate (14.87 as against 15.67), an increase in the birth-rate (32.75 as against 31.94), and a slight falling off in the number of marriages per 1000 (9.24 as against 9.49). The figures are calculated on the basis of a population estimated at 655,800. The average of the surplus of births over deaths for the past ten years was 9.749, showing consequently an increase of 1999 over the average of the past ten years. Under the head of infant mortality the report states that 3151 deaths of children under one year were registered in 1924, as against 3057 in 1923, or an increase of 94. The infant mortality death-rate for 1924 is the lowest observed in Montreal since the organisation of the bureau of statistics, but Dr. Boucher finds a decrease of 2.4 per 1000 births not sufficient, and believes it would be improved by reliable milk by-laws.

A by-law has been drawn up by Dr. Boucher, and was prepared to the end that a more effective hygienic control over the condition of milk might be imposed by employing educative measures towards the producer and retailer. The by-law embodies the rules for producing a clean, healthy milk, and keeping, transporting, and handling it until it reaches the consumer. In those cities, according to Dr. Boucher, where pasteurisation has been adopted, it has resulted in the appreciable diminution of deaths among nurslings. New York is quoted, where the ravages of tuberculosis have decreased amongst children under 15 years through pasteurisation by 53 per cent., when the figures for 1924 are compared with those 25 years ago. The new by-law allows the sale of natural and sterilised, as well as pasteurised, milk, so that the public may buy what they desire. Pasteurisation seems to be in high favour in the cities both of Canada and the United States, but the new milk by-law, which it was anticipated would pass without objection, has been held up temporarily, and at the time of writing has not been passed.

Inadequate Accommodation in the Hospitals of Montreal.

Superintendents of the Montreal institutions for treating the sick and injured, English and French, find the overcrowded condition of their institutions serious. Major A. K. Haywood, superintendent of the Montreal General Hospital, pointed out recently that Montreal requires 1500 more beds for general cases. In his opinion, a city with adequate hospital facilities should have 5 to 7 beds per 1000 inhabitants, whereas Montreal has only 3 to 5. But he considers the reason that Montreal cannot build additional wards is not so much because of the capital expenditure as because of the cost of maintaining the beds when accommodation has been found. Every public ward, he went on to say, means a loss to the hospital. With the present large deficits facing the boards of management, these cannot consider the addition of more beds until assurance is given as to the financing of them. Dr. L. A. Lessard, secretary of the Notre Dame Hospital, has stated that every day his hospital is compelled to turn away emergency cases. The situation is better now than it was and than it will be in the winter, but is serious even at this season.

A Proposed Jewish Hospital in Montreal.

Dr. N. Vincent, President of the Montreal Clinical Society, at a meeting of the organising committee of a proposed Jewish and General Hospital in Montreal,

stated that there is accommodation for only 1 out of 10 cases which require hospital treatment. He pointed out that there were English Protestant hospitals, French Catholic hospitals, and he hoped that there would be a Jewish hospital, where the particular tenets of the Jewish religion as to diet could receive due consideration. Jewish graduates would also have a better opportunity of learning clinical work, though the proposed hospital would not be entirely for Jews, of whom there are between 60,000 and 70,000 in Montreal. Dr. A. Bercovitch, secretary of the organising committee, announced that the medical men interested in the project had promised \$20,000 towards its cost. The erection of the hospital as proposed would cost about \$500,000, and accommodate 150 beds. A resolution was passed unanimously voicing the need of the institution.

Fellowships at McGill University.

Awards of four Cooper Research Fellowships in experimental medicine at McGill University have been announced recently. The Cooper Research Fellows are: Dr. A. R. Elvidge, who held a Fellowship last year and is reappointed for another year; Dr. G. Garvin Miller, now of the Ford Hospital, Detroit; Dr. G. S. Mills, Montreal General Hospital; and Dr. J. C. Clelland, of the Royal Victoria Hospital, Montreal, who are appointed to Fellowships for the first time. The Cooper Research Fellowships take their name from the late James Cooper, of Montreal, who died in 1912, leaving in his will a fund of \$50,000 to promote research and to improve teaching.

Treatment of Insane in Canada.

A radical change in the methods of treatment of the insane, or the presumably insane, is to be introduced into the Province of Quebec. It is the establishment of a psychiatric hospital, in which the classification of the mentally disordered or abnormal will be facilitated. In such an observation hospital cases will be studied in order to decide what kind of treatment is required in cases which are considered curable. Of course the incurables will be transferred to the usual insane institutions. In Great Britain this mode of treatment is in use to some extent, and in the United States is employed more widely. The psychiatric hospital in the Province of Quebec, the construction of which is in progress, will provide accommodation for 250 patients.

Motor-car Accidents in the Province of Quebec.

In 1924, in the Province of Quebec, motor-car accidents were responsible for 139 deaths. The total number of deaths for 1923 was 117. Thus 1924 shows an increase of 19 per cent. over 1923. It is believed that to the carelessness of motor-car drivers the majority of accidents were due, especially to contempt of traffic rules.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Influence of Factory Work on Parturition.

Dr. Hirsch, of Berlin, has conducted a valuable piece of research concerning the effects of factory work on pregnancy, birth, and the post-partum period. Most of his investigations were carried out on women workers in textile factories, of whom there are in Germany more than 500,000. On an average 40 per cent. are married, and among these the total annual number of pregnancies is about 10,000. It is interesting to learn that the ratio of miscarriages occurring in women working at spinning machines and at looms, compared to the incidence among women not engaged in factory work, is as 16 to 1 and 6 to 1 respectively, whilst the number of stillbirths in the textile districts is double the average for the whole country. Only 30 per cent. of the births among female textile factory workers were normal.

This is due, Dr. Hirsch holds, to the fact that narrowness of the pelvis is very frequent among textile workers, because women begin factory work at a time when the body is still growing. The incidence percentage of narrow pelvis and of pathological births increases in direct ratio to the youth of the worker. Female textile workers are worn out at the age of 40, when the male worker is still in possession of his strength. The Berlin Medical Society, before which Dr. Hirsch read a paper on the subject, resolved to direct a petition to Parliament to the effect that women should not be allowed to work more than six hours per day in the third and fourth month of pregnancy and four hours in the fifth and sixth month, and should not work at all during the last three months; that seats should be provided for pregnant women whose work requires long periods of standing or walking, and extra rooms where they might repose in cases of necessity; that the institution of canteens which already exist in many of the larger factories should be made compulsory; that medical women should be appointed as factory inspectors for the especial care of pregnant women; that troubles connected with pregnancy should be regarded as illnesses under the Workmen's Insurance Act; that sick-clubs therefore should be compelled to provide in cases of pregnancy and normal confinements medical attendance, and sick-pay similar to the provisions made in the case of an illness.

Amendment of the Workmen's Insurance Acts.

By a recent Act the law concerning the insurance of workmen against accidents has been amended to the effect that certain trade diseases now rank as accidents. By the terms of the Act a medical man attending a workman who is suffering from a disease due to his trade is obliged to notify the case to the local insurance office (*Versicherungs-Amt*) which has to inquire into the matter and to provide for the indemnification of the workman according to the provisions of the accidents insurance law. The following diseases are to come under the provisions of the Act: poisoning by lead, phosphorus, mercury, arsenic and their compounds, benzol and its congeners; further, chimney-sweeps' cancer, tar cancer, paraffin cancer, pitch cancer, cancer caused by anthracite and similar substances; glass makers' cataract, diseases caused by Röntgen rays, ankylostomiasis in miners, and pulmonary diseases of metal miners in Saxony.

Lectures on Puberty.

A series of lectures on puberty were delivered before the Berlin Pædiatric Society recently. Prof. Spranger first dealt with the subject from the psychological standpoint; he pointed out that other circumstances besides the sexual symptoms characterised puberty; such general symptoms were the beginning of consciousness of the ego, the awakening of phantasy, leading often to poetical production. The fluctuations between predilections of quite different kinds—e.g., music and sports—were common. He differentiated sexuality from eroticism. Early sexual enlightenment, he held, was advisable when it answered questions which are in the foreground of adolescent interest, but it was altogether doubtful whether enlightenment was able to give control of the sexual impulse. Young people desire to be understood, and he who understands a youth may easily influence him, whilst youths are antipathetic to people who do not understand them. Dr. Aron spoke on puberty as a physiological process, and expressed his conclusion that puberty depended on the glands of internal secretion which contribute to the growth of the body. The hormones of the generative glands were active in the last stage of the condition. He drew attention to the fact that in townsfolk puberty developed earlier than in country people, and earlier in the well-to-do class than in the proletariat. The more slowly puberty developed, he said, the more natural it was. The principal cause of early puberty in town people was due, in his opinion, to the fact that they had less

physical exercise than country people. Muscular activity, which is a greater factor in the life of country children, stimulated growth and strengthened the heart and the lungs. A future generation would be able to state whether the spread of sports among the town youths had had an influence on the age of onset of puberty, and had rendered the development of town people more like that of country people.

Death of Prof. Bernard Naunyn.

Prof. Bernard Naunyn, one of the most celebrated German physicians and teachers of clinical medicine, died recently in Baden-Baden at the advanced age of 86. He was born in Berlin, his father being at one time mayor of that city. He studied medicine in Bonn and in Berlin, where he graduated in 1862. He first made researches in anatomy, but soon became an assistant to the late Prof. Frederichs, who was at that time one of the most distinguished clinicians of the University of Berlin. Naunyn's work on jaundice and on the theory of fever led to his appointment as professor of medicine at the University of Dorpat. In 1871 he held a similar appointment at Berne, and in the following year at Königsberg. In 1888 he succeeded Prof. Kussmaul at the University of Strassburg, and he remained there until 1904. On retiring from active work he lived in Baden-Baden, and gave his services as consultant when necessity demanded to the international public of that health resort. During the war, in spite of his advanced age, he acted as consulting physician to a military hospital at Baden. His numerous published works concerned localisation of cerebral diseases, dealing particularly with aphasia and cerebral pressure, also diseases of the gall-bladder and diabetes. Together with Prof. Klebs and Prof. Schmiedeberg he founded in 1873 the *Archiv für Experimentelle Pathologie und Pharmakologie*, and with the late professor of surgery, Dr. Mikulicz, the *Mitteilungen aus den Grenzgebieten zwischen Medizin und Chirurgie*. He also published three essays on general medical questions, and latterly wrote his memoirs. Among his well-known assistants were Profs. Minkowski, Eichhorst, and Weintraud. He was an excellent teacher, and was much esteemed by his patients and his pupils.

An Epidemic of Enteric Fever.

In Anklam, Pomerania, a town of 15,000 inhabitants, a severe epidemic of enteric fever has broken out. The number of cases at present is 200, of which eight have proved fatal. The patients have been conveyed partly to the university hospital of Greifswald, which is in the neighbourhood, and partly to the local infirmary where a number of provisional barracks have been erected; 3000 of the inhabitants have undergone preventive inoculation. It has been possible to prevent the spread of the disease to the neighbourhood, a very important fact, as Anklam is situated near the favourite Baltic seaside resorts, which are at present crowded with people from Berlin and other cities. The Government Health Department have sent Prof. Lanz to the spot where, in conjunction with the professor of clinical medicine and the director of the Hygienic Institute of Greifswald University, he has examined the cause of the epidemic. They have ascertained that the epidemic started from a dairy near the town, where the majority of the patients had bought their milk.

CHELSEA HOSPITAL FOR WOMEN.—This hospital has opened a floor with 18 beds for the accommodation of patients able to pay a weekly fee of £5 5s. Very moderate fees will be charged for operations. The diseases admissible, as in the rest of the hospital, are those peculiar to women. The success obtained by the hospital in this work is shown by the available figures. H.M. The Queen, the Patron, in paying recently a visit to the new nurses' home in connexion with the institution, expressed her gratification at the extension of the activities of the hospital, whose benefits are now being brought within the reach of a class of patient for whom there is at present insufficient accommodation.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the health statistics for 1924 of a group of districts situated on the fringe of the metropolis:—

Name of district.	Estimated mid-year population (R.G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Willesden U.D.	171,161	16.6	10.4	1.04	1.2	2.2	32	73	1.4
Tottenham U.D.	153,100	18.6	10.2	0.99	1.1	2.0	32	62	2.4
Ilford U.D.	88,791	16.2	9.9	0.73	1.3	1.9	19	43	0.7
Edmonton U.D.	70,450	19.7	10.1	1.05	1.1	2.2	—	56	5.1
Wimbledon B.	58,090	14.0	11.1	0.76	1.5	2.2	37	72	3.7
Hendon U.D.	57,530	16.2	9.2	0.71	1.4	1.4	22	43	2.1
Finchley U.D.	47,810	15.9	9.2	0.73	1.0	1.8	29	50	3.9

U.D. = Urban district. B. = Borough. — = Information not included in report.

Willesden.

Dr. George F. Buchan reports that ten cases of small-pox occurred in Willesden in 1924, all in one house. The type varied from mild small-pox to the most virulent hæmorrhagic form, and three of the ten cases proved fatal. The infector of the first of the ten cases could not be traced. Supervision of the contacts proved effective and there was no spread of the disease in Willesden. Two of the contacts under observation developed small-pox, one in the Midlands and one in London, and were at once isolated on the appearance of symptoms without further spread of the disease. Out of 12 notified cases of puerperal fever, nine of the births were attended by a doctor, one took place before the arrival of the doctor, one occurred in a London hospital, and the twelfth was attended by a midwife. Twenty-nine cases of ophthalmia neonatorum were notified. In 19 the birth was attended by a doctor, in nine by a midwife, and the remaining case was born in a hospital. Vision was unimpaired in 25 cases; in one case the eye was permanently injured and in two cases the babies died from other causes, and one case was under treatment at the end of the year. The percentage of babies brought to the welfare centre was 17.9, and the number of births to expectant mothers who attended the antenatal clinic was 255. The total births were 2843. Thus less than 10 per cent. of the mothers attended the antenatal clinic. The schools for mothers have made good progress and the mothers have shown a marked interest in the lectures and demonstrations arranged. Among the school-children nearly 90 per cent. of the medical defects followed up were treated, but only 11 per cent. of the dental defects. In an appendix on school dental work, Dr. Buchan points out "that as a result of all the dental inspection, clerical notices, and visitation by the health visitors only 563 out of 9358, or 6 per cent., of the children requiring treatment received the same up to Dec. 31st, 1923." Dr. Buchan goes on to urge the importance of attention to the teeth during childhood.

Dr. Buchan gives the history of the negotiations for an open-air school which have been going on since July, 1911, and points out that the provision of an up-to-date open-air school with a mentally defective

department would enable the unsuitable and inefficient schools at Furness-road, Leopold-road, and Leinster-road to be abolished. The percentage of verminous children has been reduced from 20 in 1914 to 7.1 in 1924. In December the Education Committee approved the formation of an experimental class for stammerers. Willesden is badly off for an efficient home-nursing service. There are some eight nurses at work in connexion with churches and associations, in addition to the one home nurse employed by the council, whereas Dr. Buchan estimates that some 30 to 40 are needed. An orthopaedic clinic for crippled children is another urgent need, and it is suggested that a local clinic be established to be based on the Stanmore Hospital and staffed by that institution. The staff of sanitary inspectors for dealing with housing inspection Dr. Buchan considers to be quite inadequate, and he suggests it be augmented.

Tottenham.

Dr. David C. Kirkhope reports that "the one great outstanding environmental defect in the district is the lack of housing accommodation." Quite a number of houses are ripe for demolition. The housing of Tottenham people has not been improved by the erection of L.C.C. houses, as these are let to families displaced from other parts of London. The pollution of the tributaries of the Lee has received special consideration, but the condition of the river is not yet satisfactory. Dr. Kirkhope hopes that this river "may yet come to be regarded as a place of beauty and a source of pleasure." A preliminary account is given of the trial of an anti-scarlatinal serum, and Dr. Kirkhope thinks the results are encouraging. The last effort to establish a branch of the District Nursing Association in Tottenham failed, and Dr. Kirkhope suggests that the council should "not allow this matter to rest until Tottenham is adequately equipped with a nursing staff for the domiciliary treatment of those requiring expert nursing care in illnesses other than those of an infectious character." The school report shows that 137 cases of otorrhoea have been treated by ionic medication and that in 82 of these the discharge from the ears has ceased. It is not claimed that these 82 have been cured and they will be kept under observation for a long period. Arrangements have been made with the North Middlesex Hospital for the operative treatment of children suffering from enlarged tonsils and adenoids, and provision is made for retention of cases in hospital where necessary.

Ilford.

Dr. A. H. G. Burton says that the housing difficulty in Ilford "has been very little eased." An inquiry at the end of the year showed "that just over 150 gallons of Grade A milk (or about one-tenth of the total sale of all milk) was retailed daily in the district." Dr. Burton thinks that the standard of Grade A milk is not exceptionally high and does not see why all milk sold should not be Grade A. He thinks the designations of milk have been unnecessarily multiplied. He finds little demand at present for pasteurised milk sold as such. "Much milk is pasteurised and sometimes re-pasteurised, but is sold as pure fresh milk to the consumer." Dr. Burton gives some comparisons with past years in order to indicate the efficiency of the school medical service. In 1908 there were 135 cases of ringworm in the Ilford schools; at the end of 1924 there were only five. The 1919 percentage of uncleanness—namely, 10.7—became 4 in 1924. After the war there were 30 cases of itch discovered by medical inspection and 116 at the clinic. Last year the corresponding figures were two and three respectively. The cases of impetigo, or contagious sores, have been reduced from 546 to 243. An open-air school is still under consideration, but a site has been approved by the Board of Education. There is no school for mentally defective children. There are 30 young persons over 16 who were certified to be feeble-minded when at school in Ilford and who

received no training. "There are 20 feeble-minded children at present attending the elementary schools and seven not attending any school who should be receiving education in a special school, either day or residential."

Edmonton.

Dr. H. W. Harding records that ten cases of encephalitis lethargica were notified in Edmonton, three of which ended fatally. Of the seven survivors, one shows a lack of concentration only; another, who was previously dull, falls to sleep at frequent intervals for a short time; a third tells unreasonable lies and has become cowardly; a fourth is mentally normal, but almost completely paralysed and has to be fed; a fifth suffers from twitching of the lids and double vision; a sixth suffers from double vision, is sleepy during the day, and easily tired; the seventh has left the district. Dr. Harding knows of two other cases which were not diagnosed or notified. Both are of the Parkinsonian type with "a mask face, general weakness, and mental lethargy." A big scheme, to cost £140,000, is in hand to improve the sewage farm which it is hoped will prevent flooding in the low-lying parts of the town and enable the sewers to be self-cleansing. The sanitary inspector reports continuous trouble from gypsies of the lowest class. Trenches have been dug across entrances in order to prevent their access to vacant land. The corporation are negotiating for the purchase of a recreation ground which is a favourite encamping place of the gypsies and which it is hoped to "control" when the property has been transferred.

Wimbledon.

Dr. A. Gilmour reports that 87 working-class dwellings of the parlour type are in course of erection on the housing estate. A new system of water filtration has been installed at the municipal public bath, Latimer-road. Negotiations are still proceeding with the Ministry of Health for a sanction to a site and buildings for a new day-nursery. Ten cases of encephalitis lethargica were notified, eight during the first six months of the year. Two cases were admitted to the isolation hospital, one of which was of the myoclonic type and ended fatally. The other cases were of a mild type, resembling influenza, and followed by giddiness, double vision, and drowsiness. A close investigation of the history did not establish any direct contact with other cases. A piece of vacant land, at the junction of Wandale, Leyton-, and Denburgh-roads, caused a nuisance owing to the dumping of offensive matter. All endeavours to trace the ownership failed, and the council obtained an Order from the Ministry of Health under Section 21 of the Public Health Amendment Act of 1907 to clean and fence the land. This was done after copies of the Order and statutory notices had been fixed to a post erected on the land for the requisite period. The school dental scheme needs extension, as the staff is unable to attend to the "leavers," which means that much of the good done by previous work is wasted.

Hendon.

Dr. T. S. McIntosh reports that the scheme for the new permanent isolation hospital, delayed by the war, now only awaits the approval of the Ministry of Health. A scheme for the coördination and extension of the maternity and child welfare and school medical work has been approved, by which the gap between infancy and the school age will be filled by reasonably continuous supervision and the treatment of dental and visual defects and of minor ailments will be adequately met.

Finchley.

Dr. Wilson Jameson thinks that Finchley's greatest need at the present time is a number of small houses containing a living room, scullery, bathroom, and two bedrooms. In the council's housing scheme this type forms less than 9 per cent. of the whole. "Such accommodation," he says, "is suitable for younger

married couples and can be let at a figure within measurable distance of an economic rent." Dr. Jameson regrets the resignation of Mr. Mellor, the organiser of physical training, and states that, in the short period of nine months, he was successful in securing the interest and coöperation of both staff and pupils, and that his work will prove of lasting benefit to the schools. He hopes that before long the Finchley education authority will find itself in a position to make this appointment a permanent one.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 1st, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 45; scarlet fever, 1377; diphtheria, 849; enteric fever, 73; pneumonia, 573; puerperal fever, 37; cerebro-spinal fever, 8; acute poliomyelitis, 5; acute polio-encephalitis, 3; encephalitis lethargica, 48; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 98. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 3 deaths from enteric fever, 27 from measles, 9 from scarlet fever, 35 from whooping-cough, 16 from influenza, and 18 from diphtheria. There were 101 deaths of children under 2 years from diarrhoea and enteritis, as compared with 64, 50, 44, and 29 in the preceding weeks. In London itself there were 6 deaths from diphtheria, 7 from whooping-cough, and 2 from influenza.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

C. R. Moore, W. J. Doody, and T. F. Crean to be Surg. Lts.

Surg. Comdr. R. B. Scribner is placed on the Retd. List with rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Maj. W. C. Nimmo, from half-pay list, retires on retired pay.

Capt. J. A. W. Ebdon retires, receiving a gratuity.

ARMY RESERVE OF OFFICERS.

N. M. MacLennan, late 2nd Lt. 3rd Camerons, Spec. Res., to be Lt.

MILITIA.

Cpts. H. Gwynne-Jones, G. E. Pepper, and W. A. Lethem to be Maj.

TERRITORIAL ARMY.

General Hospitals: Lt.-Col. (Bt.-Col.) J. H. Ray resigns his commn. and retains his rank with permission to wear the prescribed uniform.

General List: Capt. G. Moore (from R.A.M.C., T.A. Reserve) to be Capt.

Capt. H. D. Smart, having attained the age limit, is retired and is granted the rank of Maj.

Lt. T. S. Torrance (late Defence Force) to be Lt.

ROYAL AIR FORCE.

Squadron Leader H. Harvey is transferred to the Reserve, Class D.2.

INDIAN MEDICAL SERVICE.

The King has approved the grant of a temporary commission as Lt. to Bercut Narain Khan.

The King has approved the relinquishment of his temporary commission by Capt. Manmahan Shammath Grutow, who is permitted to retain the rank of Capt., and has approved the resignation of his commission by Capt. A. F. G. Raikes.

KIRKBY MOORSIDE ORTHOPÆDIC HOSPITAL.—On July 31st Princess Mary opened the Yorkshire Orthopædic Hospital at Kirkby Moorside. The building consists of three wings with wards that will accommodate 100 beds; one of them is named after the Rt. Hon. J. R. Ferens, of Hull, who has given generously towards the cost. An operating theatre, a gymnasium, staff quarters, and a refectory have been provided, and the site was given by Mrs. Edward Thaw, of Welburn Manor.

Obituary.

**WILLIAM WYNN WESTCOTT, M.B. LOND.,
M.R.C.S., L.S.A., D.P.H.**

THE death is announced from Durban of Dr. Wynn Westcott, well known as one of the most active of London coroners, at the age of 77 years.

William Wynn Westcott was born at Leamington, the son of Dr. Peter Westcott, of Oundle. He was educated at Kingston-on-Thames Grammar School and University College, London, graduating in medicine at London University in 1871, after having taken the M.R.C.S. and L.S.A. a year previously. For ten years he was in general practice at Martock, Somerset, where he was certifying factory surgeon and local secretary of the Sydenham Society, and then came to London as medical officer of health for Islington, an appointment which he shortly relinquished on being chosen deputy coroner for Central Middlesex and Central London. Thereafter for a period of 26 years he acted as coroner for North-East London, during which time he held inquests numbering not many less than 1000 a year. At this time he was admitted a member of the Middle Temple.

With his original mind and outspoken habit, the coroner's court over which he presided became noteworthy for eliciting other important matters than the immediate cause of death in the particular case. At one time he noted that every tenth case he inquired into was a death of an infant while in bed, and the lenient view of an "accident" began to be less general. He was a sharp critic of official death returns, for he had abundant experience of the reluctance of medical men to certify the actual cause where this was due to fault or failing. Simple natural deaths of adults were in his view nearly all due to cerebral hæmorrhage or to syncope consequent on heart disease, but he would have been a bad judge before whom to advance this view when it might conceal more sinister circumstances. He formed the opinion that the best witness in most criminal injuries was the police surgeon of several years' standing, and that in cases of poisoning an analytical chemist was more useful than an expert pathologist. His book on the history and causation of suicide was based on knowledge and experience gained in the court where he had on the average a case a week to investigate. It was a great regret to him that the pathological discoveries of the coroner's court were not systematically recorded and preserved.

Public work outside the coronership occupied much of Dr. Westcott's time. He was one of the first presidents of the Society for the Study of Inebriety, he was a constant attendee at the Medico-Legal Society's meetings, and for a long while he was a divisional director of the Red Cross Society in Islington. He collaborated with the late Mr. William Martindale, F.C.S., in the production of the Extra Pharmacopœia which appeared in 1883, and was sold out in a few weeks; and for 18 editions his intimate medico-legal knowledge and his shrewd advice in points of doubt and difficulty were invaluable in helping Mr. Martindale and his son to keep the volume scrupulously up to date as a work of reference. Dr. Westcott was a widely read man who placed his culture freely at the service of others. Quite recently he had contributed papers to the Theosophical Society on such subjects as conscience, prayer, music, and Mohammedan doctrine. He made a hobby of Egyptian and Hebrew antiquities and was an authority on books concerning magic and alchemy, being chief of the Rosicrucian Society of England.

His home life was marred by bereavement. His wife, the daughter of Mr. E. Crawford Burnett, predeceased him four years ago, and of his five children only a daughter survives. Two sons, one qualified in medicine, the other in dentistry, died at the outset of their careers, and he also lost two daughters. His memory will be cherished as one who did much for his time and generation.

GEORGE KENNEDY SMILEY, O.B.E., M.B.,
B.A.O. R.U.I.

Dr. George Smiley, Regional Medical Officer to the Ministry of Health in the Manchester area, whose death occurred recently at Alderley Edge, was born and educated in Londonderry, entering Queen's College, Belfast, for his first medical training. As a young man he was characterised by the independence of judgment, which marked all his life, while he was known among his student contemporaries as a skilful and daring half-back at Rugby football. He graduated in medicine at Dublin in 1897, went to sea for a year, and then, after a short period in the south of England as an assistant, settled in Londonderry in general practice. Here he grew interested in ophthalmology, and became attached as honorary surgeon to the Eye Hospital of the city, taking out for several years post-graduate courses at Moorfields. In 1906 he married and left Ireland to carry on a practice in Derby, and while here he began his intimate association with the British Medical Association on being appointed secretary of the Derby Division. He was duly elected on the Representative Body and the Council of the Association, and when the National Health Insurance Act came into force became secretary of the Derby Local Medical Committee, and later of the Panel Committee. In 1916 he was chairman of the Medical Benefit Sub-Committee, a position which he held for two years, when his fairness and width of outlook led to his election as chairman of the Insurance Committee.

When the war broke out he found work ready to hand at the dépôt of the Sherwood Forresters at Normanton, where he eventually acted as P.M.O., and, though without a commission, his services were later recognised by the award of the O.B.E. About six years ago he contracted an acute sepsis which, after an illness of many months' duration, left him with a damage to his left hand, such as rendered it impossible for him to carry on general practice, so that his appointment upon the Regional Medical Staff of the Ministry of Health, which was particularly well justified by his character and career, was one that he was able to accept with gratification. He was selected to fill the important post of the Manchester area, and soon established himself in the esteem of the insurance practitioners in that city and of his own colleagues in the service. Unhappily signs of serious abdominal mischief showed themselves last year, and while a palliative operation gave him relief, and indeed wonderfully good health for 15 months, the issue was merely postponed. He died on August 2nd, bearing the last two months of his illness with fortitude under the care of a devoted wife, to whom we express our sympathy.

THE LATE DR. S. J. LEONARD.—Stephen Joseph Leonard, L.R.C.P. Irel., L.A.H. Dub., died at his residence, Warrington, on July 31st, in his sixty-ninth year. A native of Galway, he studied medicine at the Royal College of Surgeons in Dublin, where he qualified as licentiate in 1893. For a time he was in practice in Dublin, and then moved to London, where he remained for 20 years as a busy general practitioner. Eight years ago he took over the practice of the late Dr. Adams in Warrington, where he proved himself a highly popular and much respected physician. He leaves a widow and four sons.

THE LATE DR. G. L. L. HAWKEN.—Giles Lockwood Lang Hawken, who died recently at Brighton after a lengthy illness, was a well-known medical practitioner in the Hurstpierpoint district. A Cornishman by birth, he received his medical training at University College Hospital, London, and qualified with the M.R.C.S. and L.S.A. in 1874. He went to Hurstpierpoint in the following year, joining Dr. Holman, and with other partnerships carried on practice for 40 years. For many years he was surgeon to St. John's College, Hurstpierpoint—one of the colleges of the Woodard Foundation—and to the local company of the Volunteer Force. Very popular in the district, he had a wide practice, his cheery manner winning a large circle of friends. He retired about six years ago, and after a few years' stay in Devonshire went to Brighton, where he passed away. He was interred at Cuckfield on August 4th.

Correspondence.

"Audi alteram partem."

PERIODIC MEDICAL EXAMINATION.

To the Editor of THE LANCET.

SIR,—I have read with much interest Dr. Otto May's article on Periodic Medical Examination in THE LANCET of Jan. 24th. For some years past in my work at the Children Homes (Detskije Doma) in Temir Khan Schura, about 500 children, I have noted the results of periodical examinations of about 500 children in a book which I call the "Bio-Sanitary Passport." Each child has his own passport, that contains: (1) results of the periodic examination twice a year; (2) changes of health occurring during the year; and (3) the condition of the child's life. If such a passport could be kept from birth and continued until death we should gain: (1) knowledge of the developments and changes of the human constitution; (2) early recognition of character (both physical and psychical), and the possibility of drawing all the advantages of prognosis and prophylaxis.—I am, Sir, yours faithfully,

DR. A. A. PETROVITCH,
Temir Khan Schura, Dayestan S.S.R., Union of
Socialist Soviet Republics (Russia).

July 18th, 1925.

THE ETIOLOGY OF CANCER.

To the Editor of THE LANCET.

SIR,—Long years ago, but not many months before Koch showed that tuberculosis was a micro-parasitic disease, I attended a Brown lecture delivered by Sir John Burdon Sanderson. The subject of the lecture was "scrofula," and the eminent lecturer told his audience that scrofula could not be a specific disease because he had collected dust from St. Paul's Cathedral, from Westminster Abbey, and from his own drawing-room; and in each instance the dust when inoculated into a guinea-pig had produced a tuberculous lesion.

It is interesting to compare this experience of mine with the opinions expressed by Prof. Powell White in THE LANCET of August 8th. He writes: "The great majority of pathologists have always recognised that the known phenomena of cancer are incompatible with the theory of an extrinsic specific causal agent. . . . To take one point only, it is now possible to induce cancer in animals without taking thought of any parasite. If an extrinsic parasite is to be considered necessary for the production of cancer, this organism must be present at all times either in all animals or else in the atmosphere."

My friend, the late Prof. Shattock, with whom I had the privilege of working for many years on the intimate pathology of cancer, held "that the parasitic hypothesis of the nature of cancer recommends itself as bringing the essential pathology of new growths into natural relation with other diseases, such as tuberculosis, the parasitic pathology of which admits of demonstration"; and further he believed that the parasitic hypothesis was the only one on which research on cancer could be hopefully based. I need scarcely add that Prof. Shattock was as conversant as any biologist (*pace* Prof. White) with the constitution of living matter. I am, Sir, yours faithfully,

CHARLES BALLANCE.

Harley-street, W., August 10th, 1925.

PERIODICITY OF CHOLERA IN INDIA.

To the Editor of THE LANCET.

SIR,—In reply to Sir Leonard Rogers's letter of June 14th, which refers to my note on the periodicity of cholera in India, I may say that I felt it incumbent on me to make my preliminary announcement as brief as possible. Apparently, however, brevity can be carried too far.

In a Memorandum on the Epidemiology of Cholera, which was written by me at the request of the Health Section of the League of Nations—and which I understand will be published shortly—I have given a more or less complete bibliography of the literature on the subject. H. W. Bellew's book and A. Herbert's work are both included in that bibliography, and are discussed in the Memorandum. The words "no such periodic trend" in my note in your columns were perhaps unfortunate, but referred, of course, only to the six-yearly periodicity, and were not intended to include Bellew's "three-year cycle," which he himself failed to substantiate. I think the last paragraph of my note plainly indicates that the Madras Presidency Public Health Department not only *can* foresee cholera epidemics, but *has* foreseen them in time to prevent disseminations of the disease. It is particularly with regard to the control of pilgrim and festival centres that we have scored our greatest successes.

I agree with Sir Leonard Rogers when he says that there are other conditions giving rise to cholera epidemics "not so simple as any 'three-year' or 'six-year' cycle." "The other work on the same subject" which I alluded to, and which is nearly ready for publication, will deal with a number of those conditions.—I am, Sir, yours faithfully,

A. J. H. RUSSELL,
Major I.M.S.

Madras, July 17th, 1925.

IS THERE A SEASONAL PERIODICITY IN SERUM RASHES?

To the Editor of THE LANCET.

SIR,—I do not think that the solution of this question is quite so simple as my friend, Dr. Brownlee, would have us believe. Some years ago (THE LANCET, March 2nd, 1918) you were good enough to publish certain tables, prepared by me, by which it was shown that the incidence of serum rashes varied with the age and sex of the patient. Other factors, besides age and sex, have to be taken into consideration—namely, the volume of serum injected (which may explain the age-incidence), the source of the serum, the quality of the serum—that is, whether it is whole or whether it has been refined—and, last but by no means least, the accuracy of the records. I confess to being horribly suspicious of those scanty rashes in July, August, and December in Table I. of Dr. Brownlee's letter. Those months are seasons of holidays and temporary assistant medical officers.

It so happens that some months ago I got out—with quite a different object—the figures for the North-Western Hospital for the years 1922 and 1923, in the same form as in Dr. Brownlee's Table I. Here they are, as in his Table II., with the exception of the theoretical number, which I, being no mathematician, am unable to supply. Perhaps he will do so.

—	Cases.	Rashes.	Percentage of rashes.
Jan.-March ..	539	225	41.7
April-June ..	354	147	41.5
July-Sept. ..	385	161	41.8
Oct.-Dec. ..	466	229	49.1

Dr. Brownlee appeals for information to those who possess it. Well, there are the records of over 20 years at the Eastern Hospital, Homerton, and of five years at this, the North-Western Hospital, Hampstead, of which, I am sure, the Metropolitan Asylums Board would allow him to make use, and for the accuracy of which I can vouch, so far as hospital statistics can be accurate.

I do not dispute the importance of the question in respect of the epidemiological points referred to by Dr. Brownlee.—I am, Sir, yours faithfully,

E. W. GOODALL.

North-Western Hospital, Hampstead, August 9th, 1925.

FAMILIAL ABDOMINAL LESIONS.

To the Editor of THE LANCET.

SIR,—I read with much interest the article by Mr. G. P. B. Huddy in THE LANCET of August 8th. He assumes that in certain families a type of stomach exists that either anatomically or functionally produces gastric or duodenal ulcer or carcinoma. Is it not at least equally, or more likely, that the familial factor, which one can admit, is concerned with diet, more particularly, as he suggests, with bad teeth, which again are possibly if not probably the result of diet? My own family history would appear to support his thesis. My maternal grandparents reared 13 children. Of these four (all females out of a total of six) suffered from stomach disease. My mother suffered from gastric ulcer for the last four years of her life, with indigestion and hæmatemesis, and died probably (almost certainly) of gastric cancer. An aunt died of hæmatemesis, another of perforated gastric ulcer, and a fourth suffered from severe attacks of melæna and indigestion. This was a long time ago, and I do not know if they had good or bad teeth, *but* I do know that as children and young adults they drank well water, and it was the family practice at the end of a meal to put salt in their tumblers and count "heads" of the visible animalculæ so killed. *This in a doctor's house!* Personally I regard the cause of ulcer as being due to sepsis. I cannot remember seeing a case of chronic ulcer with a clean mouth of natural teeth, though I have seen them in cases where carious teeth have been removed and a false set substituted after the ulcer had occurred.

While on this subject I may perhaps be allowed to add the following interesting fact. Yarmouth is annually visited by a large number of the Scotch fisher-folk; it is an unquestioned fact among the members of our hospital staff that with their arrival there is a greatly increased rate in the admissions for perforated ulcers. I should say that we usually get three or four admitted during the season of three months. I myself had three cases last fishing. What the factor is is only guesswork, but they are great salt eaters, and the girls drink the brine out of the barrels. Also they are perforce uncleanly in their habits and their teeth are not good.

I am, Sir, yours faithfully,

R. LEONARD LEY, M.B., B.C. Camb.

August 10th, 1925.

PS.—In regard to my mother's family, the boys all, as far as I know, escaped stomach trouble, yet the relative incidence in males is much greater. The boys would be more often away from home and would and did leave home earlier. This points very strongly to the foul well water being the causative factor.—i.e., sepsis.

THE SITE OF BETHLEM HOSPITAL.—The governors of Bethlem Hospital have offered to present five acres of the site to the London County Council as an open space. Of the total of 14 acres, which will be vacated by the transfer of the hospital to the Monks Orchard Estate, about three are occupied by the buildings.

WORK AND FINANCE OF ST. BARTHOLOMEW'S HOSPITAL.—In 1924 the excess of ordinary income over total expenditure was £9535; the ordinary income was £181,805. The in-patients numbered 9208, and their average stay was 23.73 days; the first attendances of casualty patients numbered 67,000; 2734 cases of street accidents or illness were brought in—nearly eight a day. Since the additional accommodation required cannot be provided on the site the governors have bought for £51,262 premises in Charterhouse-square and Charterhouse-mews suitable for the housing of a large portion of the nursing staff. The first block of the new nursing home has cost £96,000, and the further section now being built will entail additional expenditure of £87,000. The nursing staff numbers 324, which is insufficient to allow for holidays, illness, and emergencies, and a material increase is contemplated. Meanwhile the governors report "a marked decrease" in the number of applications for general training. The hospital's laundry work cost £7383, and more than a million and a quarter pieces were washed during the year.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Adjournment for Summer Recess.

BOTH Houses of Parliament adjourned for the summer recess on Friday, August 7th, until Nov. 16th. In the House of Lords the Royal Assent was given to over 60 Acts passed during the session, including the Therapeutic Substances Act, the Diseases of Animals Act, the Summer Time Act, the Public Health Act, and the Dangerous Drugs Act.

HOUSE OF COMMONS.

TUESDAY, AUGUST 4TH.

National Health Insurance Regulations.

Mr. HARNEY moved: "That a humble Address be presented to His Majesty praying that the National Health Insurance (Medical Benefit) Amendment Regulation (No. 2), 1925, which was presented to Parliament on the 6th day of July last, may be annulled." He said his motion was really directed against one part of the Regulation. Under the National Insurance Act the country was divided into areas, each administered for medical benefit purposes by a committee of representatives of insured persons, of approved societies, and of the medical profession. Subordinate to that body there was a subcommittee in each area whose function was to hear and conciliate or decide with reference to grievances alleged by patients against the conduct of panel doctors. It was important that such a committee should have upon it a representative of the medical men so as to prevent panel doctors being victimised. It was equally necessary that there should be on it representatives of the insured, because otherwise the doctors might be "whitewashed." It was essential that neither party should have a controlling voice. The position was met 13 years ago by composing these committees of six—three representing the insured persons and three from an outside body selected by the panel doctors. The chairman was elected by a majority of votes.

This system worked exceedingly well for 13 years, and it was not until recently that difficulty arose owing to the Regulation which he was asking the House to annul. It arose in London because the medical members of this subcommittee were not agreeably disposed towards a chairman who had been there seven years, and who had given the utmost satisfaction to the other members. In their view he did not lean as much in their favour as they wished, and three of them stopped away and rendered abortive the whole proceedings of the subcommittee. The Minister of Health, of course, acted properly, but by reason of some misunderstanding the only side that was heard before this new Regulation was made was the medical side, the very one which should have been least heeded under the circumstances. The new Regulation did three things. It said that the chairman in the future should be elected not by a majority but unanimously, and that if there was default in the finding of the chairman, or the proper election of a chairman, the Superintending Insurance Committee was to be skipped over and the whole power was to pass directly to the Minister. Surely it was contrary to every principle of local government that a body which had the administration of the medical benefits of this insurance scheme, and had to impose penalties on doctors who acted improperly, should not be given a voice in the appointment of their chairman in cases where a difficulty arose. In such cases under this Regulation the Minister could appoint a chairman who need not even be a member of the committee. He was glad to understand that the Minister was not indisposed to meet him as far as he reasonably could. Those for whom he spoke were not wedded to any particular form provided that the Minister made some suggestion that would leave the appointment of the chairman as it formerly was in the hands of the majority, so that it would not be in the power of one recalcitrant doctor to object and thus render the committee powerless.

Sir GEORGE HUME seconded the motion, and Mr. CAMPBELL, who said he happened to have been a member of the London Insurance Committee, and the chairman of the Pharmaceutical Committee, at the time that this incident occurred, supported Mr. Harney's proposal.

Mr. NEVILLE CHAMBERLAIN (Minister of Health) said he would not go into details owing to the lateness of the hour, but he must not be taken as accepting the account of what took place given by Mr. Harney. It was not accurate in several respects. The reason for the Regulation was that a state of affairs had arisen in which this subcommittee had ceased to function in London. That could not be allowed to continue in fairness to the patients. Some means had to be found of restarting the machinery. The object

of the Regulation was not to interfere with local government, or to give the Minister arbitrary powers, but to find a way out of the impasse. He had gone into the question with the parties to the dispute and he was prepared to withdraw the article in the Regulation and to substitute for it another provision as follows: That the chairman of the medical subcommittee should, in the first instance, be appointed by a majority of the votes of the subcommittee. If he could not be appointed because the two sides of the committee were voting in opposite ways, the committee being divided in equal numbers so that no majority could be obtained, or if the committee failed to function by reason of the fact that the chairman appointed was unacceptable to some of the members of the committee and they did what had been done in this case, and declined to function, then the matter was to be referred to the insurance committee itself, and the insurance committee would then appoint the chairman, and they would have power to appoint a chairman who would not necessarily be a member of the committee, but if he were an outside person he would then have to be co-opted a member of the committee if he were accepted as chairman of the subcommittee.

But they had to contemplate the possibility that the subcommittee might not accept him as chairman, and again decline to function. In that case he (the Minister) would propose that the insurance committee should make representations to the Minister, and the Minister himself, after consultation with the committee and with the panel committee, would himself then appoint a chairman, who again might be somebody outside the committee, but who in that case would have to be co-opted. Those were the main proposals. He conceived that it was just possible that a deadlock might arise over some other point than the acceptability of the chairman, and he would safeguard against a possibility of that kind by providing that, if the committee were unable to function on account of some other reason than the fact that the chairman was not acceptable to the members, then the insurance committee should have the power to put before the Minister a scheme for the reconstruction of the medical services subcommittee, and the Minister would have power to approve it or to modify it. The proposal was one which went as far as he could go.

Mr. HARNEY said in the circumstances he would withdraw his motion.

Dr. SALTER, speaking on behalf of the doctors concerned, particularly those on the London panel, said that the compromise suggested would be entirely acceptable.

WEDNESDAY, AUGUST 5TH.

Civil Population and Poison Gas.

Mr. CECIL WILSON asked the Secretary of State for War whether the Committee of Imperial Defence had come to any decision as to the methods to be taken for the protection of the civil population against poison gas; and, if not, when such decision might be expected.—Sir L. WORTHINGTON-EVANS replied: Consideration of this question is progressing, but I cannot say when it will be completed.

Sir J. NALL: Is it not a fact that the Moscow Government are offering prizes for new inventions in poison gas?

No answer was given.

Medical Advice to Wives of Naval Officers.

Mr. HARRISON asked the First Lord of the Admiralty whether he would arrange for medical advice and treatment to be given to wives of naval officers whenever possible.—Mr. DAVIDSON (Parliamentary Secretary to the Admiralty) replied: The wives of a few naval officers serving in shore establishments and paid out of Vote 8 may be attended, free of charge, by the naval medical officer of the establishment, provided his duties permit; but I regret that in view of the urgent need for economy it is not possible to arrange for the extension of this privilege to the wives of naval officers generally.

Medical Officer of Scottish Board of Health.

Dr. SHIELS asked the Secretary for Scotland if a medical officer had recently been, or is being, appointed by the Board of Health; what salary was offered; and whether or not the vacancy was advertised.—Captain ELLIOT (Parliamentary Secretary to the Scottish Board of Health) replied: No appointment has recently been made to the medical staff of the Board of Health. They have, however, under consideration the question of filling a vacancy caused by the death of one of their medical officers together with the appointment of an additional district medical officer. When a decision has been reached these vacancies will be advertised in accordance with the usual practice and all necessary particulars will be available to intending applicants.

Service Patients in Mental Hospitals.

Mr. WALTER BAKER asked the Minister of Health whether any distinction was made between ex-Service men and other patients during their stay in mental hospitals; what was the average cost of the food supplied to each ex-Service

patient at present in the mental hospitals throughout the country; whether he was aware that bread and margarine were given for breakfast and tea without variation throughout the year in many of these institutions; and whether he would consider the possibility of increasing the standard of comfort of the men who were under the control of his department.—Sir KINGSLEY WOOD replied: "Service" patients are classified in the private class during their stay in mental hospitals, and a weekly allowance of 2s. 6d. is provided to each man for additional comforts. The limited class of ex-Service patients for whom the Ministry of Pensions do not accept responsibility are also treated as private patients, but receive no weekly allowance. It is not possible to state the average cost of the food supplied to "Service" patients separately from the other patients in the mental hospitals. With regard to the last part of the question, I am informed that since the publication of the report of the Departmental Committee on Dietaries in Mental Hospitals the breakfast and tea meals have been considerably varied. I may add that the welfare and comfort of the inmates of mental hospitals are subjects which are constantly in the minds of the authorities responsible.

Child Labour in China.

Mr. JOHNSTON asked the Secretary of State for Foreign Affairs whether he was now in a position to give any information bearing upon the question whether the British mill-owners at Shanghai had agreed to adopt the regulations of the Child Labour Commission, whether or not these regulations were adopted in the other factories in Shanghai.—Mr. MCNEILL (Under Secretary for Foreign Affairs) replied: The regulations proposed by the Child Labour Commission have not been voluntarily adopted by any of the mills in the International Settlement at Shanghai pending enforcement by by-law, but the Cotton Mill-owners' Association, including all British mills, have expressed approval of their main provisions. I am informed that since September, 1923, the British mill-owners in Shanghai have endeavoured to keep out boys under 10 years and girls under 12 years of age.

Medical Supplies in Morocco.

Mr. MACKENZIE LIVINGSTONE asked the Secretary of State for Foreign Affairs whether, in view of the increasing scale of military operations, and particularly aerial bombardment, in Morocco, and the suffering likely to be caused through lack of medical stores, he was now prepared to support the claim of the British Red Crescent Society to be allowed to supply the Rif with such stores.—Mr. MCNEIL replied: H.M. Government are not prepared to intervene in a matter respecting which it is entirely for the Spanish and French Governments to make a decision.

THURSDAY, AUGUST 6TH.

Dietary at Leeds Pensions Hospital.

Mr. ROBINSON asked the Minister of Pensions whether his attention had been drawn to complaints made by patients in the Beckett's Park Hospital, Leeds, as to the nature of the food supplied; and whether he would give instruction that in future butter should be supplied and that these disabled men should not be given bread and margarine to eat.—Major G. C. TRYON replied: I am not aware of any complaints made by patients in the hospital referred to in regard to the nature of the food supplied, and none were disclosed at a recent inspection of this institution. With regard to the latter part of the question, the medical officer in charge of a case is authorised to prescribe the supply of butter where he considers it necessary. I am not prepared to authorise, in the case of this hospital, any change in the general scheme of diet which has been adopted on medical advice for all the hospitals of the Ministry.

The Use of a New Anaesthetic.

Colonel DAY asked the Minister of Health if his attention had been drawn to the recent discovery by Dr. A. J. Copeland of a new anaesthetic which would serve as an alternative to cocaine; and if he had considered whether this new drug had any toxic properties which brought it within the scope of the Dangerous Drugs Act.—Sir W. JOYNSON-HICKS (Home Secretary) replied: I am not aware of any such discovery by Dr. Copeland, but he recently made an investigation into the properties and effects of psicaine, a cocaine substitute prepared by German chemists, the results of which were published in the medical press. A caution as to the supply and use of the drug has been issued through the pharmaceutical press.

Purity of Milk and Food Products.

Sir WILFRID SUGDEN asked the Minister of Health (1) whether, in view of the fact that milk was found to be adulterated and not up to standard by his officers in 1922 in 7.7 per cent. of samples taken, in 1923 in 7.8 per cent.,

and in 1924 in 7.7 per cent., he would take steps to reduce this high percentage of adulteration; and (2) whether, in view of the high percentage of adulteration or not up to standard of general food products—viz., 5.9 per cent.—discovered by his officers during 1924 and its consequences on our population, he would take further steps to ensure the purity of food products.—Mr. NEVILLE CHAMBERLAIN replied: The general question of food adulteration is engaging my attention, and I am about to issue regulations designed to give effect to the principal recommendations of the recent Departmental Committee. I may also remind my hon. friend that as regards milk additional powers of sampling are contained in the Milk and Dairies (Consolidation) Act, 1915, which will come into operation on Sept. 1st next.

Maternity Centres and Birth Control.

Mr. THURLE asked the Minister of Health if he was contemplating any changes in the instructions issued by his department to maternity centres for their guidance in dealing with birth control.—Mr. NEVILLE CHAMBERLAIN replied: I have had this matter under very careful consideration and have decided that in all the circumstances of the case it is inopportune to make any change in the instructions.

Expectation of Life and Post Office Insurance.

Sir GERALD STRICKLAND asked the Postmaster-General whether, in view of the established facts as to the prolongation of the expectation of life on account of the progress of medical science, he was prepared to revise accordingly the tables of the expectation of life on which premiums were paid for Post Office insurances.—Sir W. MITCHELL-THOMSON replied: I have had this matter under careful consideration, but regret that I am not yet in a position to make any statement.

Veterinary Inspection of Dairy Herds.

Mr. MACKENZIE LIVINGSTONE asked the Secretary for Scotland what local authorities in Scotland now carried out veterinary inspection of dairy herds.—Sir JOHN GILMOUR replied: The Scottish Board of Health have no definite information in regard to a systematic veterinary inspection of dairy herds in rural areas. But it is understood that in some of these areas a more or less systematic inspection is in operation. The counties of Lanarkshire, Ayr, and Dumfries have whole-time veterinary inspectors who endeavour to overtake this work. It is hoped that more detailed information will be available when the Milk and Dairies Act, 1914, has been in operation for some time. So far as the majority of burghal areas is concerned, and particularly in the cities and large towns, a systematic veterinary inspection of cows is carried out once a quarter or less frequently. In no case does the above veterinary inspection include systematic tuberculin testing.

FRIDAY, AUGUST 7TH.

Incurable Officers in Pensions Hospitals.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Pensions whether he would consider an alteration in the present system of procedure with respect to officer patients in Pensions Ministry hospitals, so that when an officer was certified by a specialist medical officer to be incurable he should be boarded at once and not be compelled to apply for a medical board, which caused several weeks' delay in the consideration of his case.—Major G. C. TRYON replied: I am glad to inform my hon. and gallant friend that the procedure suggested by him has recently been authorised. In any case where an officer in receipt of conditional award is considered by the medical officer in charge of the hospital to be likely at the conclusion of his treatment to be in a materially more disabled condition than is represented by his current award, the patient is boarded before discharge and a provisional award suitable to his condition is made.

Cost of Medical Research.

Mr. DUCKWORTH asked the Minister of Health the sum devoted by the State this year to the promotion of medical research; and what amount had been similarly applied in each year since the war.—Mr. W. GUINNESS (Financial Secretary to the Treasury) replied: The provision made in the Scientific Investigation Vote, 1925-26, in aid of the expenses of the Medical Research Council is £135,000. The grants in previous years have been as follows:—1924-25, £140,000; 1923-24, £130,000; 1922-23, £130,000; 1921-22, £130,000; 1920-21, £125,000; and 1919-20, £148,500. In addition certain inquiries are from time to time carried out by or on behalf of the Ministry of Health, the Scottish Board of Health, and the Service Departments. It is not practicable to give the whole cost of these inquiries, but it is relatively small.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the quarterly Final Examination of the Conjoint Board, held from July 7th to 31st, the following candidates were approved in the under-mentioned subjects:—

Medicine.—R. B. Alston, St. Thomas's; W. A. Ball, King's Coll.; F. G. Beauchamp, Birmingham; J. M. Brodrick, Liverpool; Irene F. Callender, St. Mary's; J. P. Carpenter, Birmingham; W. S. Chapman, Univ. Coll.; Dorothy A. Chown, St. Mary's; G. Coope, Manchester; P. F. S. Court, Guy's; Anne A. Craig, Royal Free; A. C. Dalzell, King's Coll.; May W. de Livera, Ceylon and Royal Free; H. V. Dicks, St. Bart's; J. Dockray, Cambridge and St. Bart's; Marjorie M. Duggan, Cardiff; G. H. Dymond, St. Bart's; J. Evans, Guy's; J. P. Evans, Charing Cross; M. M. Fikri, Cairo; G. W. S. Foster, St. Bart's; A. C. Gairdner, London; S. E. Gawthrop, Durham; A. P. Gorham, Bristol; G. J. Gregerson, Adelaide and London; R. N. Hall and L. J. Haydon, St. George's; Kathleen M. Horton, London; J. P. Huins, Birmingham; J. W. Jeffery, St. Mary's; Mary Jennings, Royal Free; D. M. Johnson, and G. L. C. Jones, St. Bart's; Adele A. Kahan, L. C. Kalra, and H. Kesselson, Charing Cross; R. H. Knight, St. Bart's; Alice B. Laker, Charing Cross; T. P. Lalonde, Bristol; A. H. Levers, Westminster; S. Levy-Simpson, London; G. M. D. Lobban, Leeds; Mary C. Luff, Univ. Coll.; I. H. Mackay, Sydney and London; Nancy S. Marshall, St. Mary's; S. Mellins, Middlesex; P. B. P. Mellows, St. Bart's; D. G. Morgan, Cardiff; Margaret E. Morton, Royal Free; Gertrude M. Nicholson, Durham; T. C. Oakley, Birmingham; S. C. St. G. C. Parry, Middlesex; F. B. Parsons, St. Bart's; L. B. Phillips, Bristol; H. P. Pieris, Madras and Middlesex; O. L. Prosser, Liverpool; R. L. Quilliam, King's Coll.; L. D. Richards, Charing Cross; Bertine M. Rix, St. Mary's; Alice L. Robson, Royal Free; E. J. Rubra, Westminster; A. G. Schroeder, Adelaide and London; J. W. Shackle, Guy's; Sara C. A. Sharpe, St. Mary's; E. V. Slaughter, Middlesex; E. Sorabjee, Guy's; A. W. E. Soysa, King's Coll.; A. W. Spence, Cambridge and St. Bart's; R. K. Stockbridge, Adelaide and London; R. G. Strouts, London; B. R. Sworn, St. Thomas's; A. G. S. Tabb, Charing Cross; G. M. Tanner, St. Bart's; Elizabeth L. Taylor-Jones, Royal Free; E. J. E. Topham, St. Bart's; I. Vitenson, London; W. N. Welinkar, Middlesex; H. L. Wilson, St. Bart's; Jessie Wiltshire, Univ. Coll.; F. G. Winterton, St. Bart's; J. Wiseman, Guy's; and Rosa S. Wordsworth, Charing Cross.

Surgery.—Y. Abdel-Messiah, Middlesex; A. R. Adderley, St. Thomas's; P. W. A. Agnew, St. George's; R. M. Ainsworth, Liverpool; V. M. Albuquerque, King's Coll.; C. R. Alderson, Univ. Coll.; R. C. Amies, St. Thomas's; E. N. C. Annis, Guy's; S. A. Antoun, Birmingham; H. Y. Awad, St. Thomas's; H. Aziz and Marion L. Bainbridge, Manchester; J. C. H. Baird, St. Bart's; D. G. Balakirsky and A. L. Banks, Middlesex; J. V. Bannehr, St. Bart's; C. E. Bigger, St. Thomas's; A. I. Bieber, Liverpool; E. Bigger, St. Thomas's; E. D. Blackwell, Middlesex; Ellen W. M. Bridge, Manchester; W. Buckley, London; F. Bunje, St. Mary's; Lillie M. Burton, Manchester; De L. Carey, St. Mary's; W. S. Chapman, Univ. Coll.; B. Chaudhuri, Middlesex; W. F. Cooper, St. Bart's; P. F. S. Court, A. R. Cox, and P. C. Cumber, Guy's; P. E. J. Cutting, St. Bart's; S. D. Dalal, Bombay; E. A. Darukhanawalla, Middlesex; S. W. Davies, Cardiff; Winifred de Kok, Royal Free; G. C. Dewes, St. George's; Mary G. H. Dickson, King's Coll.; G. Dignam, Manchester; W. H. Dowell, Guy's; I. A. Evans, Cardiff; O. F. Farndon, R. R. Fells, and P. H. Floekton, St. Bart's; R. M. Forsayeth, London; S. W. Gabbe, St. Thomas's; S. E. Gawthrop, Durham; J. F. E. Gillam, St. Thomas's; B. M. C. Gilson, St. Bart's; Z. A. Goma, Birmingham; E. P. Gough, St. Bart's; S. E. Goulstine, Durham; D. P. Gray and W. H. Green, Middlesex; L. A. N. Greenway, King's Coll.; H. W. Greenwood, Middlesex; Margaret H. Greg, Royal Free and Manchester; J. C. P. Grey, St. Thomas's; H. R. Griffin, Middlesex; B. J. Griffiths, Cardiff; G. J. Gross, King's Coll.; K. H. A. Gross, St. George's; W. S. Grove, Guy's; F. P. Guilfoyle, St. Bart's; C. W. Harrison, Los Angeles and St. Bart's; A. Hobson, Birmingham; D. P. Holmes, Westminster; R. L. Holt, Manchester; L. E. Houghton, Guy's; S. Howard, London; Ruth T. Hurnard, Royal Free; I. A. Jackson, Guy's; E. D. Jones, St. Bart's; J. Kahanas, Berne and London; W. R. Kirkpatrick, Guy's; P. H. Knowles, Bristol; S. N. Lahiri, St. Andrews Univ.; M. E. Lampard, King's Coll.; C. G. Le Couilliar, Middlesex; A. H. Levers, Westminster; H. M. Levy, Middlesex; S. Levy-Simpson, London; D. W. E. Lloyd, Guy's; A. J. McMillan, Middlesex; F. G. Martin, Charing Cross; R. G. Mathews, Univ. Coll.; Clara Mendelssohn, Westminster; R. D. Milford, St. Thomas's; D. E. J. Mitchell, Manchester; F. E. Montague, St. Thomas's; C. M. Moody, St. Mary's; P. Morton, London; D. H. P. M. Q. Mylchreest, St. Thomas's; T. K. Natesan, Madras and London; C. E. Nicholas, London; H. E. Nourse, Middlesex; Eileen A. Nugent, Royal Free; T. C. Oakley, Birmingham; E. J. O'Keefe, London; C. J. S. O'Malley, St. Thomas's; A. Orliansky, Middlesex; C. H. Parker, London; G. E. G. Peirce, St. Mary's; W. G. Porter, Guy's; Winifred E. Probert, Westminster; F. W. F. Purcell, St. Thomas's; Marjorie D. Reddan, Royal Free; A. M. Rhydderch,

London; L. D. Richards, Charing Cross; R. I. Roberts, Manchester; P. H. Rossier, Lausanne and Zurich; D. J. L. Routh, Univ. Coll.; I. J. Sachs, Middlesex; M. Schwartz, Univ. Coll.; S. T. Seccombe, St. Thomas's; J. Silverstone, Westminster; H. J. Simmons and K. S. Smith, Middlesex; R. E. Smith, Guy's; J. Spencer, St. Bart's; F. E. Stabler, Durham; H. B. Stallard, St. Bart's; C. A. Stanley, St. Thomas's; A. F. H. Stewart, Guy's; Mary Stirk, Manchester; Stella C. C. Stuart, Royal Free; E. D. Thomas, Middlesex; R. S. Tooth, St. Bart's; D. Vidoofski, and R. J. Vince, London; F. H. A. Walker, St. Bart's; E. Walsh, Manchester; L. H. F. Walton, St. Thomas's; T. E. Watkins, Cardiff; J. K. G. Way, Guy's; Ruth E. Webster, Westminster; H. L. Wilson, St. Bart's; J. T. Woodhead, St. George's; A. T. Worthington, St. Bart's; and H. P. Yew, Guy's.

Midwifery.—A. R. Adderley, St. Thomas's; R. M. Ainsworth, Liverpool; V. Albuquerque, King's Coll.; C. E. Allen, Guy's; R. B. Alston and R. C. Amies, St. Thomas's; H. K. Ashworth, Manchester; F. J. Bach, St. Bart's; Marion L. Bainbridge, Manchester; W. Baker, Leeds; A. L. Banks, Middlesex; J. V. Bannehr and S. B. Benton, St. Bart's; Florence K. Bibby, Charing Cross; C. E. Bigger, St. Thomas's; C. R. Birnie, King's Coll.; M. S. R. Broadbent, St. Bart's; Gladys Brocklehurst, Manchester; V. H. Brink, London; A. Burlingham, Univ. Coll.; Lillie M. Burton, Manchester; E. S. Caley and A. L. Canby, St. Thomas's; E. Carew-Shaw, St. George's; M. S. Chafey, Charing Cross; G. P. Chandler, St. Thomas's; J. R. B. Chatterton, Univ. Coll.; B. Chaudhuri, Middlesex; S. Chazen, Guy's; F. H. Chick, Birmingham; J. C. K. Chilcott, King's Coll.; A. Clark, St. Bart's; W. J. S. Clemmey, Liverpool; R. Cohen, Leeds; A. Coleman, London; A. B. Connell, St. Thomas's; R. G. Cooke, Liverpool; D. H. Couch, Guy's; J. B. Crabtree, St. Bart's; Olive C. Crowley, Charing Cross; A. T. Curnow, Guy's; P. E. J. Cutting, St. Bart's; A. J. Daly, London; A. C. Dalzell, King's Coll.; S. W. Davies, Cardiff; T. E. Davies and T. S. Dewey, St. Thomas's; Marjorie M. Duggan, Cardiff; J. J. F. Dunn, St. Mary's; G. C. Edwards, St. Thomas's; J. A. Edwards, St. Bart's; E. S. Evans, St. Thomas's; R. Evans, Guy's; M. M. Fikri, Cairo; B. Fink and S. J. Firth, Manchester; P. H. Floekton, St. Bart's; Elsie G. M. Ford, Leeds; J. N. C. Ford, St. Bart's; H. K. Fozdar, London; J. N. Freudenheim, Charing Cross; T. D. W. Fryer, St. Thomas's; S. C. Gawne, Liverpool; P. Gibbin, Cardiff; J. F. E. Gillam, St. Thomas's; W. L. Gillbard, St. Bart's; R. S. Glennie, St. Thomas's; G. Gorstige, Leeds; D. P. Gray, Middlesex; R. M. Greenop, King's Coll.; H. W. Greenwood, Middlesex; F. P. Guilfoyle, St. Bart's; B. Guyster, London; J. G. Hattingh, Liverpool; A. C. de B. Helme, St. Bart's; A. Hobson, Birmingham; R. L. Holt, Manchester; M. F. Hope, King's Coll.; F. R. How, St. Thomas's; Mary H. McC. Huggett, King's Coll.; Ruth T. Hurnard, Royal Free; D. H. Isaac, Cardiff; R. J. Isaac, St. Mary's; K. M. N. Isaacs, London; I. A. Jackson, Guy's; N. M. Jerram, St. Thomas's; T. Jones, Cardiff; Adele A. Kahan, Charing Cross; J. H. Kitson, Manchester; Olive C. Knight, Charing Cross; R. H. Knight, St. Bart's; F. W. Law, C. G. Le Couilliar, and D. T. Lewis, Middlesex; P. C. K. Lewis, Birmingham; R. Lewthwaite, Middlesex; L. Lipschitz, Berlin and Middlesex; A. J. Lomax, Manchester; Mary C. Luff, Univ. Coll.; W. H. S. McGregor, St. Bart's; Mary A. C. MacHugh, King's Coll.; B. W. S. Mackenzie, Univ. Coll.; Evelyn T. D. MacLagan, Royal Free and St. Mary's; G. R. Malkin, St. Bart's; I. O. Martin, Cardiff; R. G. Mathews, Univ. Coll.; R. W. L. May, St. Thomas's; W. Mayne, Guy's; A. J. M. Melly, St. Bart's; Clara Mendelssohn, Westminster; R. D. Milford, St. Thomas's; J. H. Miller, Birmingham; H. L. Milles, King's Coll.; J. C. Milner, London; C. M. Moody, St. Mary's; Margaret E. Morton, Royal Free; C. E. H. Moykopf, Guy's; D. H. P. M. Q. Mylchreest, St. Thomas's; C. B. Nicholson, Middlesex; D. Nicklin, Birmingham; G. A. H. Norman, Westminster; H. E. Nourse, Middlesex; Eileen A. Nugent, Royal Free; Audrey S. Nunn, Charing Cross; R. Okell, St. Bart's; C. J. S. O'Malley, St. Thomas's; J. E. J. Falser, London; L. B. Phillips, Bristol; H. P. Pieris, Middlesex; D. Plum, St. Thomas's; C. G. E. Plumstead, St. George's; Winifred A. L. Pollock, Westminster; Margaret M. Price, St. Mary's; E. K. Pritchard, St. Thomas's; Winifred E. Probert, Westminster; J. D. Procter, Univ. Coll.; R. L. Quilliam, King's Coll.; J. D. T. Rear, Guy's; A. M. Rhydderch, London; J. H. Ripka, London; Bertine M. Rix, St. Mary's; L. Roberts, Middlesex; Sibyl D. Rodgers, King's Coll.; R. P. Ross, King's Coll.; P. H. Rossier, Lausanne and Zurich; E. J. Rubra, Westminster; J. A. Rushworth, Manchester; Margaret M. Russell, King's Coll.; C. H. Saint Johnston, Birmingham; J. W. Schofield, Middlesex; R. H. Scott, St. Mary's; J. A. Screech, St. Thomas's; M. Sendak, St. Mary's; W. D. Sheldrake, Guy's; Mary A. Silcock, Charing Cross; J. Silverstone, Westminster; H. Simmonds and G. Simon, St. Bart's; J. F. Simpson, St. Mary's; H. Sissons, Manchester; E. M. Smith, Univ. Coll.; K. S. Smith, Middlesex; L. G. Smith, St. Bart's; R. E. Smith, Guy's; H. B. Stallard, St. Bart's; Beryl M. Stevens, Royal Free and St. Mary's; I. H. K. Stevens, Univ. Coll.; R. K. Stockbridge, Adelaide and London; K. R. Stokes, St. Bart's; Stella C. C. Stuart, Royal Free; R. D. Summers, London; B. R. Sworn and C. C. Taffs, St. Thomas's; Dorothy S. Tait, St. Mary's; G. K. Taylor, St. George's; S. P. Taylor, Bristol; L. H. Thomas, St. Thomas's; R. Thorpe, St. George's; J. C. T. Tregarthen, Guy's; F. B. Turner, London; W. J. D. Twort, Univ. Coll.; D. Vidoofski, London; D. C. Virmani, Charing Cross; H. Waldenberg, Leeds; F. H. A. Walker, St. Bart's; J. K. G. Way, Guy's; H. D. Weatherhead, St. Thomas's; T. C. S. Webb, Univ. Coll.; Ruth E. Webster, Westminster;

T. H. Wehlburg, St. Bart.'s; Janet Welch, Royal Free; J. G. Wigley, St. Thomas's; Beatrice A. Wilkinson, King's Coll.; G. H. J. Williams, London; H. Williamson, King's Coll.; N. J. Willans, Middlesex; H. Winch, St. Bart.'s; W. R. Wood, St. Thomas's; and H. R. Youngman, St. Thomas's.

THE LISTER WARD AT GLASGOW ROYAL INFIRMARY.—The famous Lister Ward, which was pulled down last year, has been "re-edified" at the Wellcome Historical Medical Museum in Wigmore-street. The walls and contents of the ward have been preserved and reconstructed, and the original fireplace and equipment transferred. This equipment includes the central pillar and round table, Lister's sterilising apparatus, and the actual beds in use in his time.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN (UNIVERSITY OF LONDON).—At recent examinations the following awards for 1925-26 have been made:—Sarah Holborn Scholarship: Miss Mary Gould; Dr. Margaret Todd Scholarship: Miss M. M. White; School Jubilee Bursary: Miss O. N. Grant; Flora Murray Bursary: Miss H. E. Newman; Alfred Langton Scholarship: Miss G. V. Smallpeice; Mabel Sharman Crawford Scholarship: Miss E. T. Moss; Helen Prideaux Post-Graduate Scholarship: Miss Gladys Hill, M.B., B.S.; St. Dunstan's Medical Exhibition: Miss E. M. G. Stevenson; Mrs. George M. Smith Scholarship: Miss G. B. Castle; Isabel Thorne Scholarship: Miss Maureen Evans.

DONATIONS AND BEQUESTS.—The late Mr. G. Collis, of The Wick, Richmond Hill, Surrey, left by will, among other bequests, on his wife's death, £500 to the Croydon General Hospital and £500 to the Royal Hospital, Richmond.—By will the late Surgeon Lieut.-Colonel Heinrich Friedrich Lawaczek Melladew, Royal Horse Guards, left £1000 in memory of his late wife and her brother, Judge Bain, to Winnipeg Hospital towards the provision of an X ray outfit for the hospital: £500 to St. Dunstan's work for Blinded Sailors and Soldiers; and £500 to the Children's Country Holiday Fund.—Under the will of the late Mr. John Douglas Oliver, of Dacre-street, Morpeth, the testator left, on his wife's death, £3000 to the Morpeth Cottage Hospital and District Nursing Association.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At Queen Mary's Hospital, Stratford, there will be an intensive course embracing general medicine, surgery, and the specialties from August 24th to Sept. 3rd. The sessions will begin either at 10 or 10.30 A.M. and continue until 5 P.M. In September a variety of courses will be held—viz., Diseases of the Chest at the Brompton Hospital, Sept. 21st to Oct. 3rd; Diseases of the Skin, Blackfriars Hospital, Sept. 7th to 19th, also the same date a course at the Infants Hospital; Ophthalmology at the Royal Westminster Ophthalmic Hospital, Sept. 7th to 26th; a series of weekly lecture-demonstrations in Electro-therapy at the Royal Free Hospital, Sept. 23rd to Oct. 14th, and a general course in medicine, surgery, and the special departments at the Westminster Hospital from Sept. 21st to Oct. 3rd. Copies of the syllabus of each of these courses may be obtained on application to the Secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

Appointments.

GREENWOOD, A. C., M.R.C.S., L.R.C.P., Lond., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Horncastle District of the County of Lincoln.

Vacancies.

For further information refer to the advertisement columns.

Birmingham University.—Lecturer in Bacteriology, £450.
Bradford Royal Infirmary.—Two H.S.'s. Each £200.
Bristol General Hospital.—H.P.'s, H.S., &c. Each at rate of £80.
Burnley, Victoria Hospital.—H.S. £200.
Derbyshire County Council.—Asst. Sch. M.O. and Tub. O. £650.
Greenwich Union.—Sen. Asst. M.O. £560. Also Asst. M.O. £400.
Hull, Victoria Hospital for Sick Children.—Res. H.P. £80.
Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.
Leeds General Infirmary.—Hon. Asst. Phys.
Leeds, St. James's Hospital.—Third Asst. M.O. £275.
Liverpool, Brownlow Hill Infirmary.—M.O. £750.
Manchester, Northern Hospital for Women and Children.—Hon. Asst. Gen. S.

Manchester and Salford Hospital for Skin Diseases.—H.S. £160.

Manchester, St. Mary's Hospitals.—Hon. Asst. S.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. S.
Plymouth Borough.—Asst. M.O.H. £560.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. at rate of £75.
West Riding County Council.—Dist. Tub. O. for Barnsley. £600.

Births, Marriages, and Deaths.

BIRTHS.

DAVIDSON.—On August 4th and 5th, at 60, Bickenhall-mansions, Gloucester-place, W., the wife of Maurice Davidson, M.D., of two sons (twins).
HEPPER.—On August 7th, at Frimley, Surrey, the wife of Dr. John E. Hepper, of a son.

MARRIAGES.

BOWIE-WILSON.—On August 1st, at the Barclay Church, Edinburgh, Major John Darling Bowie, D.S.O., R.A.M.C., to Winifred Margaret, daughter of the late John Wilson and Mrs. Wilson, of Braidwood, Corranie-gardens, Edinburgh.
CARTER-WESTMACOTT.—On August 5th, at St. Martin-in-the-Fields, Ernest Edwin Carter, M.B., B.S., to Eileen Helen Maude Westmacott, second daughter of the late Colonel H. R. Westmacott, Welch Regiment, and Mrs. Westmacott, of Woodside, Ashley, Hants.
SIMPSON-BATTEN.—On August 5th, at St. Mary Abbot's, Kensington, Reginald Hugh Simpson, M.D., M.R.C.P., to Joyce Rayner Batten, M.B., B.Ch., younger daughter of Dr. and Mrs. Rayner Batten, of Campden Lodge, W.

DEATHS.

ATKINSON.—On August 6th, from pneumonia, Dr. Arthur William Atkinson, of Mirion House, Crewe.
DANIEL.—On August 2nd, at Beaminster, Dorset, Thomas Palmer Daniel, M.R.C.S., in his 89th year.
DUKE.—On July 22nd, at Kenmare, Victoria, B.C., Valentine de Samarez Duke, L.R.C.S. Irel., L.K.Q.C.P. Irel., formerly of Nuwara Eliya, Ceylon, aged 79.
JOHNSON.—On August 9th, at 4, Heath-hurst-road, Hampstead, Florence, the dearly beloved wife of Dr. Rance Johnson.
KELLETT.—On August 3rd, at Waterloo-road, Bedford, Leonard Henry Kellett, M.D., Inspector-General R.N., ret'd., aged 73 years.
WYNNE.—On August 4th, at Killard, St. Martin's, Guernsey, John Darley Wynne, M.B., son of the late Frederick Wynne, Bishop of Killaloe.
N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, Wimpole-street, London, W.
MONDAY, August 17th, to SATURDAY, August 22nd.—ALL SAINTS HOSPITAL, Vauxhall Bridge-road, S.W. Clinical demonstrations Wednesday evening, Thursday afternoon and evening, and Saturday afternoon. Wed., 2 P.M., Mr. H. E. Griffiths on Neoplasms of the Testis.—**QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.** Intensive course in General Medicine, Surgery, and the Specialties. First week as per syllabus. Morning and afternoon sessions.

INDEX TO "THE LANCET," Vol. I., 1925.

THE Index and Title-page to Vol. I., 1925, which was completed with the issue of June 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

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Notes, Comments, and Abstracts.

MEDICINE AND SCIENCE AT WEMBLEY.

A VISIT to the British Empire Exhibition at Wembley may be made the occasion of a useful study of public health and the applications of science to human need.

The Ministry of Health has issued a guide (price 3d.) to its exhibits in H.M. Government Pavilion, where the first hall is occupied with an historical sketch of the medicine-man with his amulets and charms, and the alchemist with his alembics, in contrast with the equipment of the modern laboratory. The exhibits illustrate the progress in the campaigns against malaria, leprosy, plague, and louse-borne diseases and in the technique of port medical work. In the second hall is a model of the Lister Ward and of a modern operating theatre, along with examples of water purification and sewage disposal, while the third hall contains well-thought-out schemes of applied medicine in municipal affairs, including housing, child welfare, industrial disease, pure food, and clean milk.

A second edition has now been issued of the handbook¹ to the exhibits of the Royal Society, which itself is worth the whole of an afternoon visit. This book is compounded of essays by some 24 distinguished scientific men in illustration of the demonstrations which are on view and of the progress of natural knowledge: it is not in any sense a glorification of modern science as the handmaid of technological success. The result is admirable, though naturally to each reader some of the sections will appeal more than others. About a third of the whole is taken up with the structure of matter and radiation; there must be many readers of THE LANCET, in whom X rays, ultra-violet light, and wireless have surprised an imperfect knowledge of modern physics, and they will find the diagram of the range of various electro-magnetic waves, which forms the frontispiece, well worth the modest price of the volume. Dr. Simpson on the water in the atmosphere and Dr. Tate Regan on Darwinism strike particularly good notes as essayists, and it is pleasant to find Prof. Poulton still standing on the impregnable rock of natural selection in his short discourse on mimicry.

Commercial Exhibits.

Many of the series of exhibits in the Chemical Section at Wembley, organised by the Association of British Chemical Manufacturers, are well worth the inspection of medical men; there may be no special appeals to clinical medicine or therapeutics save in a few directions, but to preventive hygiene there are many. Such matters as the materials for house construction and their preservation, for road manufacture, for paving and for fire-proofing are of growing importance to doctors, as questions of domestic accommodation, sanitary environment, and convenient transport become more intimately associated with public health. Such stalls as those of Messrs. Albright and Wilson, Messrs. Brunner Mond, Messrs. Chance and Hunt, and Messrs. Naylor Brothers can be studied with advantage, while the products exhibited by the Gas Light and Coke Company and the South Metropolitan Gas Company will be also found of practical interest.

The fine display of Messrs. Burroughs Wellcome is of considerable historic interest to medical men. At the stand of this firm, and still bearing the dents of hard usage and particles of earth from the world's highest mountain, a relic of the Mount Everest expeditions of 1921, 1922, and 1924 may be seen—it consists of the "tabloid" medicine chest as supplied for use in these huge adventures. The medical officer in charge of each of the expeditions has sung the praises of this chest, which in 1922 travelled over 1000 miles by yak transport—the most trying in the world, and has served for three successive expeditions. It is still fit to do duty with a fourth. The case which accompanied R 34 in the first airship flight from England to America and back is also shown, prompting the representatives of the firm to anticipate a distant time when leviathans of the air will carry their own physician and medicines for a passenger list approaching in length that of a Victorian liner. Here also is the actual tube of solidified ginger essence, one of the four phials of "tabloid" medicines, which Peary carried in his last dash to the North Pole. Here are the cases which Amundsen and Scott carried to the South Pole in 1911-12. One case bears in Amundsen's handwriting the inscription, "Sydpolem, 14-12-1911." The other is sadly devoid of inscription. What may be termed "the explorers' corner" in this display also contains dioramas of the following pioneer events: Stanley crossing darkest Africa, the final attempt to climb Mount Everest, Blieriot flying the Channel, Alcock flying the Atlantic, Ross Smith on the final stage of his flight to Australia, the U.S.A.

¹ Phases of Modern Science. By various authors. London: A. and F. Denny, Ltd. 1925. Pp. 232. 3s. 6d.

world-flight airmen arriving at Croydon. In every instance the original "tabloid" medical equipment which served these pioneers on their travels is shown.

At the stand of the Clayton Aniline Co. everything is designed to remind us of the discovery which led to the manufacture of aniline on a commercial scale, and gave the first impetus to the development of the colour industry. This was in the "fifties" of the last century, and in 1875 the Clayton Aniline Company, Limited, was founded for the manufacture principally of aniline oil and salt. Ever since the company has added to its activities, more or less as a natural outcome, the manufacture of dyestuffs. Although at first aniline was used almost exclusively as the starting-point in the production of synthetic dyestuffs, only a small proportion of the total dyes now produced are actually derived from aniline, but the term "aniline dyes" is used as a popular expression to cover practically all coal-tar intermediates and dyes. The Clayton Aniline Co.'s exhibit does not rely only on the number of colours shown, but calls attention to the evidence supplied of the accumulated knowledge of years of research and experience in a most intricate industry. Some 250 dyes appear of various hues and shades, and are shown in their application to cotton, woollen, silk and artificial silk fabrics, leather, and paper. There are colours for practically all industries, textiles, leather, glass, rubber, and paper, each providing opportunities for the chemist. The Clayton Aniline Company also shows the products manufactured in England of the "Ciba" brand pharmaceutical specialties, one of which, "Phytin," is symbolised at the stall in an attractive statuette, the work of Miss Phyllis Mott. Cases are being shown of Dial, Didial, and Elbon "Ciba" tablets, of other products whose therapeutic effects have been noticed in our columns, such as Lipiodine "Ciba" tablets and Digifoline tablets—this last being a preparation of vegetable origin, containing the glucosides of digitalis leaf in their natural proportions, free from inert or harmful extractives.

A large range of technical products is displayed by various firms whose names are widely associated in the public mind with activity in the production of bleaching powders or perfumes. Among these are Messrs. Boake Roberts and Co., who show, in addition to many essential oils and terpeneless oils used in perfumery, a range of sulphur dioxide salts with a wide technical application, and a recrystallised menthol which conforms to B.P. requirement. The Castner-Kellner Alkali Company issue a number of interesting pamphlets upon chlorine derivatives and products in relation to public health; the Erasmic Company, Ltd., show many samples of scented preparations in a striking colour scheme; Messrs. J. and E. Atkinson show a complete range of toilet preparations; Messrs. Thomas Fell and Co. specialise in pot-pourri; the Graesser-Monsanto Chemical Works include on their stall some fine specimens of phenol and cresol derivatives; the various employment of hydrogen peroxide inspire the exhibits of Messrs. B. Laporte, Ltd.; bismuth salts occupy a prominent position at the stall of Messrs. Thomas Tyer and Co.; the stand of the United Alkali Co., Ltd., indicates the various products of the company both in heavy and refined chemicals and in dye products; Messrs. Edwards and Gritton call attention to their medicinal paraffin prepared from Russian petroleum; the Electro-Bleach and By-products, Ltd., show high grades of bleaching powder and caustic soda, as well as Sesqui carbonate of soda, and samples of anhydrous ferric chloride and an especially fine carbonate of lime; and Messrs. Grieve and Gordon make a feature of eucalyptus preparations. Messrs. Charles Roberts and Co. exhibit models of standard tank wagons for the conveyance of all forms of chemical liquids.

Messrs. G. M. Taylor show a fine range of artificial eyes, sadly required in post-war days; and Messrs. Baird and Tatlock, at a stand fitted by the firm's own men, and made at their own works, demonstrate the materials used by them in fitting up laboratories. The finish is that normally used in laboratories, and the same type of benches and finish are in use in the modern laboratory exhibited by the Ministry of Health.

The apparatus on view, it will be seen, covers a wide range from chemistry to psychology, from mechanics to bacteriology.

AN OVERCROWDED MENTAL HOSPITAL.—The Commissioners of the Board of Control state that the Salop Mental Hospital, upon which otherwise they report favourably, is overcrowded. The accommodation is for 313 males and 388 females, but the average number resident during the past year has been 347 and 424 respectively. The construction of the building will not allow of proper classification, and the Commissioners say that the hospital can only be brought into line with similar institutions of more modern construction by the erection of an admission hospital with cottages for recovering and convalescent cases. The accommodation for nurses is "far from ideal."

SOME

Practical Considerations

IN THE CONSERVATIVE TREATMENT OF FRACTURES OF THE PELVIS AND LOWER EXTREMITY.*

A Course of Four Lectures delivered for the University of London at St. Bartholomew's Hospital

BY SIR WILLIAM I. DE COURCY WHEELER,
M.D. DUB., F.R.C.S. IREL.,

PAST PRESIDENT, ROYAL COLLEGE OF SURGEONS IN IRELAND.

LECTURE II.

THE views of the older writers on the subject of injuries to bones are worthy of study. In the process of literary excavations we come across some useless débris, but here and there are found nuggets of pure gold.

FRACTURES OF THE NECK OF THE FEMUR.

Astley Cooper, whose investigations are so imposing in the history of the surgery of bones, explicitly states that in all cases of transverse fracture of the neck of the femur which he has had the opportunity of examining, he has never seen one in which there was union by bone. "The dissections which I have made," says this illustrious surgeon, "have convinced me that fracture of the neck of the femur, when it is situated within the capsule, is never united by bone. The union is solely effected by means of ligamentous substance, as in fracture of the patella." "This celebrated surgeon," says Dupuytren, "has since modified his opinion, as we find him remarking that, as a general rule, fracture of the neck of the femur within the capsule is united by ligament and not by bone, as in the case of the olecranon and the patella, but that it would be a rash assertion to deny the possibility of ossific union, and to maintain that the general rule laid down admits of no exception." This was more or less the teaching up to our own time. Fifteen years ago I treated an aunt of my own, aged 70, in a plaster case with abduction and internal rotation, and obtained bony union.

One of the first statements made by Dupuytren, in an essay on fractures of the femur, is that he never saw a fracture of the neck of the femur in a child. We know now this is not uncommon, and after such a statement we wonder whether it is worth while referring back to authorities of the pre-X ray era. The reason I do so is this—that credit must be given to Dupuytren for anticipating to some extent the modern work of Whitman, Jones, and other authorities for whom we all have such deep respect.

Dupuytren points to specimens in the Museum of the Faculty of Paris and of the Hôtel-Dieu, where numerous examples of intracapsular fractures united by bone are to be found, and states that he regarded osseous union of intracapsular fracture of the neck of the thigh bone as demonstrated beyond doubt. He disproves and discounts all arguments advanced at the time against the possibility of bony union. He denied that the upper fragment was devoid of sufficient blood-supply, and showed that the vessels passing to the head via the ligamentum teres were sufficient. The importance of the ligamentum teres in preserving the viability of the head of the femur has been established beyond doubt by Bonn.¹ Dupuytren showed that the neck of the femur is not devoid of periosteum, as stated by some contemporaries, and that the bathing of the fragments in synovial fluid could not be a determining factor in

connexion with non-union, as it does not affect the union of fractures into other joints.

But then comes this significant statement. "The fact is, that the great difficulty lies in the perfect and accurate adjustment and relation of the fractured ends of the bone," and he insinuates that if this can be accomplished bony union may be expected. He was a shrewd observer, for he realised that union in this situation must be slow, and suggests as an axiom that fractures of the neck of any bone should be kept at rest twice as long as ordinary fractures of the same bone, and even after that period displacement might occur.

He does not seem to have realised the full importance of abduction, but his description of the reduction of a fracture indicates that he was not oblivious to its significance. He describes his procedure thus: "The patient being placed on his back, and the pelvis being fixed by assistants, I bend the thigh on the belly by raising it, and then gently draw it from the body, the knee being at the same time flexed. This is immediately followed, without difficulty or the employment of violence, by the limb resuming its natural length and the foot its normal direction." By flexion he relaxed the adductors which produce eversion of the foot, and the glutei and others which draw upwards the shaft of the bone. He adopted the principle of Percival Pott, who introduced the flexed position of limbs in the treatment of fractures generally. He designed a double inclined plane splint, the thigh being fixed at nearly a right angle to the pelvis and the leg forming a similar angle with the thigh. He says by this method union takes place without shortening, and quotes some convincing cases.

Although abduction is the essential feature in the treatment of fractures of the femoral neck, the arguments of Dupuytren in favour of the double inclined plane are impressive. His reasoning is so persuasive that I wonder why this old method fell early into disuse and was supplanted by so unsatisfactory a treatment as weight-and-pulley extension. If there is any one thing I am proud of in the treatment of fractures over the last 25 years, it is this—I have never used a long Liston splint, and I have never treated a fracture of the neck of the femur by Buck's extension.

It is interesting to note that in 1921 Moore contributed an article in the *Boston Medical and Surgical Journal* recommending that the fracture be reduced under an anæsthetic, and the leg put up in right angle flexion of both hip and knee in a plaster cast. In this way the patient can sit up and be moved about in a wheeled chair from the very first. Out of 42 cases so treated by this method, the average age of the patients being 65 years, 60 per cent. gave a good result.

If the thigh is flexed at right angles with the abdomen and the knee at the same angle with the thigh, the relaxation of the muscles tends to prevent shortening, and any progressive power of contractility which follows after this position is assumed cannot assert the direct pull which produces shortening when the limb is extended. Flexion of the leg corrects eversion of the foot, as was pointed out by Dupuytren in 1846, and again in an excellent paper by Russell as recently as January, 1924, in which he says: "That upward lifting of the bent knee is the natural way of inverting the limb when we wish to correct eversion. Instinctively we first bend the knee and then lift it upwards. The practical fact is that eversion gives no trouble."

Fractures of the Neck of the Femur in Children.

First importance attaches to the partial fracture-separation of the epiphysis of the head of the femur. The condition is most often found in or about puberty, more often in boys than in girls. It may arise out of some comparatively trivial and forgotten trauma. Any displacement which occurs may be gradual, the diaphysis yielding in an upward direction and becoming gradually rotated outwards in relation to

* All the cases referred to were illustrated by lantern slides. Lecture I. was published in THE LANCET of August 15th, p. 313, and Lectures III. and IV. will appear in subsequent issues.

¹ Arch. f. klin. Chir., 1924.

the head. Solid union takes place, leaving behind a traumatic coxa vara.

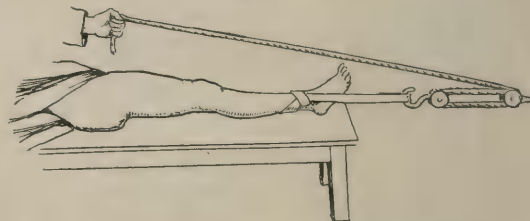
It is a difficult injury to diagnose early, even with the help of X rays, and Sir Robert Jones says it is the most often overlooked of all hip injuries, even by extremely good surgeons. It is suspected when rotatory movements are extremely painful, and when abduction beyond a short range is impossible. There is, at first, no shortening, and the symptoms disappear with rest, but later on, when activities are resumed, shortening occurs, and separation of the epiphysis, partial or complete, will be then recognised. In contrast to this, there may be a complete separation of the epiphysis, a fracture through the neck, or a fracture involving both neck and epiphysis.

Whitman calls special attention to fracture of the neck of the femur in children. The fracture occurs after traumatism to the hip, probably more frequently than separation of the upper epiphysis. It is generally impacted or of the greenstick variety, but the signs and symptoms are much the same. The immediate results are good, but yielding at the point of fracture will produce a coxa vara if the limb is not protected from weight-bearing for many months by a calliper splint. The immediate treatment, whatever the position of the fracture may be, is the same as in adults. Shortening and eversion must be reduced, with subsequent fixation in the position of abduction.

To obtain reduction; flexion and inward rotation followed by traction and abduction, or abduction alone, are required. Seven cases of ununited fracture of the femur in early life are mentioned by Whitman, to prove that non-union may follow this injury in childhood if the treatment is inefficient. Thus he shows that non-union is not accounted for by deficiency of blood-supply, nor by advancing years, but by inefficient treatment. Plaster-of-Paris fixation is the best, and after six or eight weeks the child may be allowed to walk on a calliper splint for two or three months. If the fracture is diagnosed and no displacement has occurred, a short period of rest

all the circumstances must be carefully weighed before the impaction is broken down to reduce moderate deformity; but it must be remembered that the so-called impacted fracture from indirect violence in elderly people is very incomplete, and functional disability will certainly follow weight-bearing in the absence of proper reduction. A decision must be made as to whether, in an exceptional case, the risk of reduction and fixation is too great.

FIG. 2.



Block and tackle extension (Jones).

Under such circumstances, crippling, non-union, and deformity must be the result, mitigated to some extent if a calliper splint can be worn.

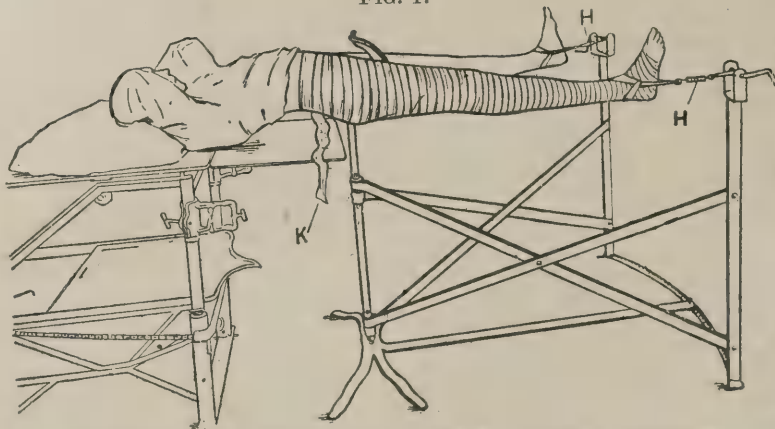
The object of treatment of this, as of all fractures, is to restore the symmetry of the broken bone, thus eliminating the primary cause of non-union, deformity, and loss of function. Henderson states that of 120 cases of ununited fracture of the hip seen at the Mayo Clinic, not one had received proper treatment at the time of the injury.

The modern treatment can be summarised in one sentence—reduction of the deformity and fixation in the abducted position. Whitman deserves due credit for insisting upon these conditions. Abduction is checked by tension on the capsule, by contact of the upper border of the neck with the rim of the acetabulum, and of the great trochanter with the side of the pelvis. In abduction the neck of the femur is normally in a horizontal position. In fracture of the neck the fractured end of the proximal fragment points laterally, and it is only by bringing the distal end of the neck into a horizontal position that accurate apposition of the fragments can be made. Not only are the fragments brought into apposition by full abduction of the leg, but the tension on the capsule provides for direct mutual pressure of the fractured surfaces. The trochanter being in contact with the pelvis, any muscular effort likely to displace the fragment is impotent, and fixation is complete.

If absorption of the neck and shortening and stiffening in the movements of the hip result after the abduction treatment, the tilt downwards of the pelvis on the affected side, in order to bring the two legs parallel for locomotion, will correct the shortening. If adduction follows treatment of an injury to the hip, the reverse is, of course, the case. The abduction treatment is now the standardised routine. To encourage us further, Whitman points out that the fracture in the aged is usually at the base of the neck, and that the central fracture is more common in the young and the vigorous. The reverse of what was formerly believed. Bearing this in mind, and also that fractures elsewhere unite readily in aged subjects, we have every ground for optimism when considering the prognosis of these cases.

It may be confidently predicted that the immediate and efficient treatment of fractures of the neck of the femur by the abduction method will be followed,

FIG. 1.



Simple orthopaedic table (designed in 1905) for treatment of fractures.

followed by ambulatory treatment with a calliper splint is sufficient.

Fractures of the Neck of the Femur in Adults.

I do not think, from the point of view of treatment, that it is necessary to say more than this—that if, in a strong adult, a fracture is impacted, and there is more than half an inch shortening with eversion of the foot, the impaction should be forcibly broken down under an anaesthetic, the deformity reduced, and the treatment carried on as in unimpacted cases. Rotation outwards of the foot matters much more than a little shortening. If the foot is in good position without any outward rotation and the shortening is inconsiderable, then it is not necessary to disimpact. If there is impaction in an old person,

in most instances, by repair. If union fails when accurate apposition of the fractured surfaces has been maintained for a sufficient time—as confirmed by X ray examinations—it indicates a low vitality in the tissues, and Whitman advises in such cases a reconstruction operation which will be mentioned later.

In 1905² I designed an apparatus for the reduction of fractures of the lower extremity which resisted manual traction, and in the absence of one of the more perfect tables of the Hawley type, I still find it useful. The original cost was £2 10s. (Fig. 1.)

The apparatus consists simply of two iron gates, about 4½ ft. long, swung on an upright which carries a perineal bar, attached to which is a small support for the sacrum of the patient which is included in the plaster, but afterwards removed. This pelvic support and the upright on which it sits are supported by a heavy stand. On the distal ends of the gates are rollers, square on section, in order to obtain a firm hold on the cords or bandages when extension is being applied. By pushing the handle inwards the square bar fits into a hole of the same shape and diameter, and so locks. This is a simple substitute for a ratchet. Fixed to the stand, and running at right angles to it along the floor between the two gates, is a bar, and the distance of the gates from this bar indicates the exact amount of abduction and enables plaster to be applied with both legs spread from the pelvis at equal angles. In this way there can be no obliquity of the pelvis. If it is desired to note the exact amount of extension required to hold the fracture reduced two Salter's sportsmen's balances, registering at least 50 lb., are necessary additions.

I have found the apparatus useful in all recent cases of fractured femur in any position where shortening could not be reduced with ease, and in the treatment of malunited fractures. It provides a substitute for the block-and-tackle pulley arrangement as a means of reducing the overlapping and shortening in the latter group, and it facilitates the application of plaster of Paris when employed during the treatment (Fig. 2).

Reduction of an Intracapsular Fracture of the Neck of the Femur.

The patient is anaesthetised. The gates are brought to the end of the table, and the patient is put astride the padded perineal crutch. Manual traction and manipulation is usually sufficient for reduction, but by attaching the foot to the end of the gate, extension and abduction are readily obtained, and the application of the plaster of Paris rendered very simple.

It is best to apply the plaster to the foot and lower third of the leg in the first instance, and when this has set a clove-hitch or a wet skein of wool, passed round the ankle and over the foot in figure-of-eight fashion—as recommended by Watson Cheyne—is connected with the ratchet. These connexions may be incorporated in the plaster bandages used to complete the cast before the extension is

released. Or, alternatively, a steel pin is passed beneath the tendo Achillis in contact with the os calcis to act as a connecting link between the foot and the ratchet. The steel pin is removed when the plaster coat is complete.

The limb on the sound side is held abducted to the normal limit by an assistant who stands at the end of the gate, or it may be attached to the ratchet by a clove-hitch. The surgeon notes the normal range of abduction on the uninjured side. The knee and the thigh are kept slightly flexed by a sling under the knee from the upright bar which is attached to the gate. This flexion corrects the inversion of the foot. The injured leg is extended by tightening the ratchet, slowly abducted by moving the gate, and rotated inwards with the hands. The surgeon or an assistant supports the joint and presses the trochanter gently downwards. The neck of the bone is first felt to hitch on the upper border of the

acetabulum, but this obstacle is easily overcome. Abduction is continued until the normal range is obtained. The trochanter rests against the side of the ilium, and the anatomical relationship between the shaft and the neck of the femur is now restored. The limb is in the Whitman attitude of extension, complete abduction, and slight inward rotation. Plaster of Paris is rolled on with great facility, with the aid of this apparatus. The plaster is allowed to dry with the patient still in position on the gates. (Fig. 3.)

In the ward the head of the bed is raised one or two feet, an inclination the reverse of that required for traction. It is more

comfortable, and Whitman thinks that the influence of this position on the blood-supply makes the chances of repair more favourable.

The completed spica (Fig. 4) is retained in position for from 8 to 12 weeks, and several more weeks are spent in bed for treatment with massage and the restoration of movements in the joints. Weight-bearing is not permitted until the movements of the joints are free and painless, and X ray photographs indicate the stability of repair.

Jones treats these cases on his abduction frame slightly modified. In very feeble patients who are bad surgical risks, a Thomas splint slung out over the side of the bed is substituted, the sound leg being kept in abduction by sandbags.

Waldenstroem³ says there is a marked difference between the results obtained when the fracture is held by a plaster cast and when it is held by extension. When a plaster cast is used, out of 15 cases 11 gave good results, 8 with bony union. In 13 cases treated by extension methods there were three good results. Bony union resulted in two.

The treatment of fractures of the neck of the femur may be summarised as follows:—

1. In all subjects, of whatever age, reposition of the fragments should be attempted, unless the patient is too frail for treatment, and then the fracture must be neglected. Sometimes, but not often, such a patient can endure walking on a calliper splint, but in the majority the rest of their lives will be spent either in bed or in a chair.

FIG. 3.



Application of plaster of Paris for fractured hip.

² Medical Press and Circular, March 8th, 1905.

³ Jour. de Chir., 1924.

2. When the fracture is reduced under anaesthesia, a plaster-of-Paris splint, as described by Whitman, is the most effective appliance.

3. To apply a plaster case properly for this fracture, some form of orthopaedic table is most desirable, but

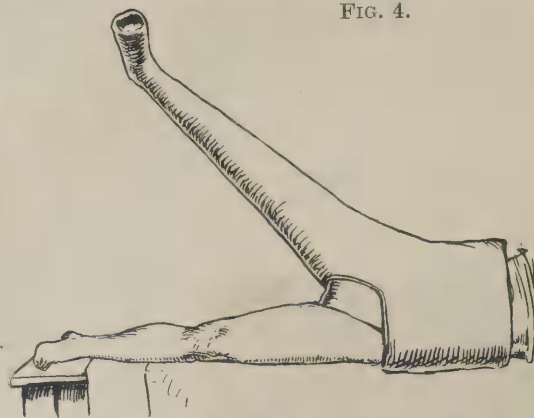


FIG. 4.
Completed plaster case (after Whitman).

a perineal prop with pelvic support which clamps on to any table, gives immeasurable help.

4. In the absence of a perineal prop, counter-fixation of the pelvis during reduction is accomplished by passing a strong bandage round the groin on the sound side, and tying it to the table near the patient's head.

5. In cases unsuitable for plaster, good abduction and extension can be maintained on Jones's frame, or the injured limb may be slung in a Thomas splint in abduction over the side of the bed, and tilting of the pelvis prevented by supporting the sound leg in abduction with sandbags.

6. The position of abduction should be maintained for at least two months.

Two recent cases illustrate the above remarks.

A woman, aged 79, was knocked down by a bicycle in 1923. She was treated by the abduction method after reduction under an anaesthetic. She has firm bony union, there is no shortening, and no loss of movements in the hip-joint. In January last I wrote asking her to report. She replied as follows in February: "My injured hip is as well as ever. I have no lameness, do not use a stick or crutches, I have no pain or limp, and have full movements."

A man, aged 70, was admitted in 1923. He was feeble and difficult to manage, and was treated by a Thomas splint slung in abduction over the side of the bed in extension; he was under supervision for three months in hospital. He reported three weeks ago, walking on crutches, with slight crutch palsy. He would not wear a calliper splint; 1½ in. shortening. Full movements of flexion and extension; strong fibrous union. With a little encouragement he discarded the crutches, but walks with a marked limp.

In this case no anaesthetic could be given, and there was no attempt at orthodox reduction. An X ray plate showed clearly an atheromatous artery in the pelvis, which is an indication of the senility of this patient, although nine years younger than the case referred to above.

Whitman's Reconstruction Operation.—Whitman has designed a reconstruction operation for old-standing cases, where absorption of the neck has taken place and where the functional result is poor. He believes that this operation is to be preferred to bone-grafting. The operation is designed to relieve pain, and to

restore early capacity in vigorous subjects. The base of the trochanter is cut through in an oblique direction with a chisel, the obliquity corresponding to the angle of the neck. A new neck is thus formed, and is thrust into the acetabulum with the leg in abduction. The trochanter is drawn downwards and is secured by a peg to the femur at a lower level.⁴

FRACTURE OF THE TROCHANTERS.

In subjects under 18 years, epiphyseal separation of the great trochanter is not uncommon. Fracture of the great trochanter is rare. When it occurs the trochanter is displaced upwards, and the best apposition can be obtained by the abduction method of treatment.

Langdon⁵ reports two cases of fracture of the lesser trochanter. Only 25 are recorded in the literature. Langdon's cases were those of boys 12 and 16 years of age. The cause is said to be a sudden strain on the ilio-psoas muscle, causing avulsion. The pathognomonic sign is inability to flex the injured limb in the sitting position. Poston⁶ also calls attention to this injury, in a boy aged 14. The treatment in the early cases was very variable, but notwithstanding the difficulty of getting accurate apposition and reduction, the results were uniformly satisfactory. Operations are therefore contra-indicated. In Poston's case a plaster spica with the thigh flexed at the hip was applied for 14 days, and afterwards treatment was carried on by massage and passive movements. He had full recovery in 36 days.

FRACTURES OF THE SHAFT OF THE FEMUR.

General Considerations.—Seventy-five per cent. of the fractures of the femur seen at the Mayo Clinic present

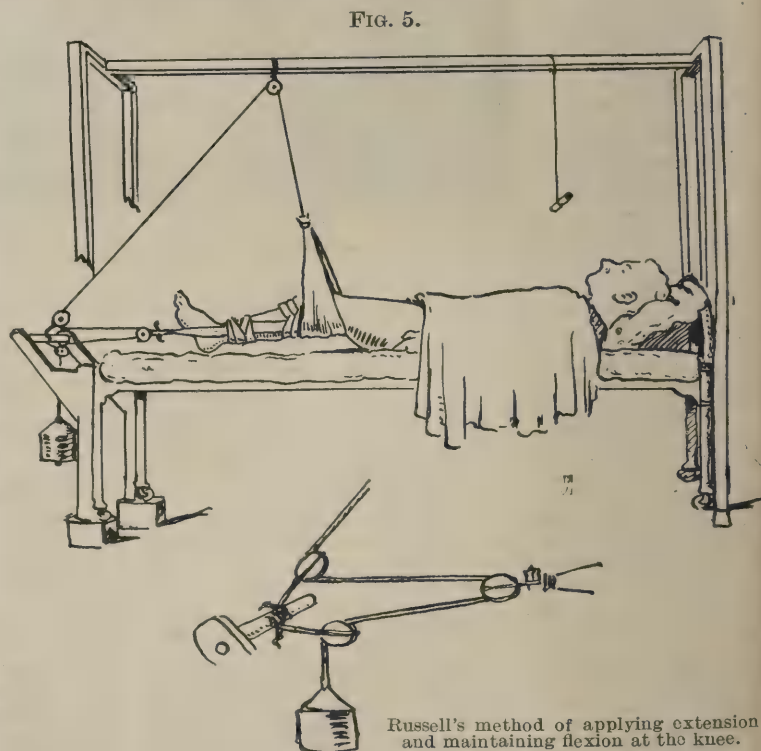


FIG. 5.
Russell's method of applying extension and maintaining flexion at the knee.

mal-union, non-union, delayed union, chronic osteomyelitis, or joint stiffening following treatment elsewhere. This is the statement of Meyerding in the "Mayo Clinics" of 1923, and it is a severe

⁴ A complete description of the operation appeared in *Surgery, Gynecology, and Obstetrics*, June, 1921.

⁵ *Surg., Gyn., and Obs.*, Abs., October, 1924.

⁶ *Brit. Jour. of Surg.*, October, 1921.

commentary on the treatment of recent fractures elsewhere.

To obtain satisfactory results in fractures of the shaft there are two alternatives open to those surgeons who prefer non-operative methods:—

(a) The shortening and deformity may be reduced under an anæsthetic at once by means of powerful traction, if necessary, on a suitable orthopædic table. The limb—including the foot and the lower part of the body—is then encased in carefully applied plaster of Paris. (I do not practise this method apart from cases of fractured hip.)

(b) The deformity may be reduced under an anæsthetic, with the knowledge that the reduction will, in most cases, not be maintained completely by any form of splint, but will be gradually restored under the influence of traction and simple contrivances to correct lateral or antero-posterior deviations.

The methods of treatment are much the same, whatever the position of the fracture. When the fracture is in the trochanteric region, it is necessary to remember that the upper fragment is usually abducted, the lower fragment drawn upwards and inwards. Occasionally, when the obliquity runs from above downwards and inwards, the upper fragment may be pushed inwards instead of outwards. It is best to treat these high fractures in abduction, although it is doubtful if the upper fragment remains abducted once the limb is placed in a position of comfortable extension. Notwithstanding this, I think abduction is the best position on the principle of "safety first"—for if union takes place with the lower fragment adducted the functional result is unsatisfactory, owing to the necessity of compensatory raising of the pelvis on the injured side.

Mr. Russell⁷ holds that there is only one circumstance which can justify operation in recent fractures of the shaft; that is, mechanical impediment to the reposition of the fragments; this is a sound doctrine.

I would like to say here that in simple fractures of the shaft of the femur, or of any other long bone, it must be an extremely difficult matter for soft structures to impose themselves between the fragments if sufficient extension is applied. All the muscles and other tissues run, for the most part, in a parallel line to the long axis of the bone, and the more they are pulled upon the more there is a tendency to disengage themselves from the line of fracture. When the patient is out of the anæsthetic, muscular tone comes into play, as if there were bands of elastic

reaching from the pelvis to the tibia and fibula, and in fracture of the long bones tonic shortening of the muscle will be progressive.

"Our first aim, then," says Mr. Russell, "will be to pull out these muscles to their correct length, and when we have accomplished this we may be sure that every other structure of the thigh will be in its correct position, including the fragments. This does not mean exact anatomical reposition, which is neither necessary nor even, in my opinion, always desirable." This is another fundamental truth, for every one with experience of the treatment of fractures knows that a slight lateral or antero-posterior displacement of fragments is of no account, provided there is no abnormal angulation or rotation.

There are many observations in Mr. Russell's paper worthy of note. "What must we pull upon?" he says; "clearly the tibia and fibula, seeing the muscles are attached to them. We are going to use strapping and bandages for the extension, and we shall, accordingly, not carry them above the knee for reasons that are obvious. I think that the practice, which

seems universal, of carrying the strapping up the thigh indicates some confusion in our mental picture of the object to be attained. Anxiety as regards the ligaments of the knee is quite needless, for, being attached to a fragment, they cannot be subject to stretching. The whole of the extending force will fall on the muscles, none at all on the ligaments. To convince ourselves of this, we only have to reflect that if the muscles were severed at the seat of fracture the limb would drop off." Mr. Russell might have gone further and said that if the ligaments of the knee were pulled upon and loosened after partial union, they very quickly took up the slack during convalescence. (Fig. 5.)

In high-up fractures of the shaft the upper fragment is usually flexed and abducted; the lower fragment is drawn up and adducted. A long-axis pull will correct the shortening, and simultaneously with the pull the limb must be brought into abduction to get proper alignment. These fractures do well in a Thomas splint slung by pulleys to a Balkan frame, with either fixed extension, as recommended by Jones, or a 10 to 15 lb. weight-and-pulley extension attached to the end of the Thomas splint (Fig. 6). The sound leg is kept in slight abduction with sandbags (or slung in a Thomas splint) to prevent tilting of the pelvis, and the foot of the bed should be raised. The foot should be maintained straight, as the

FIG. 6.



Fracture of the femur (upper third). Patient in bed after reduction. Note gauze glued to sole of foot to support it at right angles.

⁷ Brit. Jour. of Surg., January, 1924.

temporary rotation outwards of the upper fragment need not be considered.

We must not think too seriously about the displacement of fragments of the shaft by muscular action. It was pointed out by Lucas-Championnière, more recently by Sir Robert Jones, and again by Mr. Russell, that the displacement caused by muscular spasm is only a transient phenomenon tending to disappear when the fracture is reduced and the limb placed in a comfortable position free from pain, but

if shortening is not reduced and the extension apparatus is inefficient, progressive contraction of the muscles is to be expected. The temporary nature of muscle spasm is particularly noticeable in fractures of the lower third. Much attention is drawn to the fact that the lower fragment is displaced backwards by the gastrocnemius muscle in dangerous relationship to the popliteal vessels. It is taught that these muscles must be relaxed in the treatment of such fractures, but numbers of surgeons, including myself, reduce them with strong extension without any misgivings whatever. The action of gravity or the tendency to fall backwards, obliterating the natural convexity forwards of the femur, with perhaps resultant genu recurvatum, is easily countered by a sling behind the point of fracture. So much attention has been paid to this in my own cases that many times I have obtained a slight increase of the natural bowing of the femur forwards, but without any undesirable after-effects as regards function.

We should remember that comfort is an essential in the treatment of a fracture. Spasms and counter-spasms occur in the search for relief and the muscles are never at rest, the fragments are disturbed and displacements result.

Treatment of Fracture of the Upper Third of the Shaft.

If the shortening can be reduced by manual extension and abduction under anaesthesia, a Thomas splint is applied and the extension tapes secured to the end of the splint while traction is maintained. If there is difficulty in overcoming the shortening at the first try, it is probable that with sufficient and continuous extension the proper length will be obtained within the first week. The Thomas splint is slung over the side of the bed on a Balkan frame in a position of abduction with the sound leg slung or supported by sandbags. (Fig. 6.) In some cases reliance will be placed on fixed extension—i.e., tightening up the tapes frequently as the muscles relax, in others a weight-and-pulley attachment is fastened to the end of the splint. If the strapping tends to slip

during the first 10 to 14 days, an assistant grasps the ankle and extends while new strapping is applied. I have had no trouble in obtaining union without shortening by these simple means.

Fractures of the Middle of the Shaft.

There should be no difficulty in the treatment of these cases with a Thomas splint slightly bent at the level of the knee. The shortening is reduced, or as nearly reduced as possible, under anaesthesia,

FIG. 7.



Powerful extension can be applied from a spat to the ratchet. The Thomas splint is then fixed in position, the tapes tied, and the spat removed.

and fixed extension is rigidly maintained to the end of the Thomas by means of the orthodox strapping and tapes (Fig. 7). It is in this position that the action of gravity, causing sagging backward of the fragments and bowing of the femur, must be countered. In rare cases shortening may still persist at the end of a week, and powerful stretching with pulleys or special appliances may be required. To prevent bowing backwards, a tight strip of bandage is clipped to the bars of the Thomas splint directly behind the fracture point; nothing more is necessary, but this band through-

out the treatment must be kept tight. If an X ray photograph shows some lateral deviation of fragments, a pull may be exerted from one bar to the other by a loop of bandage round the limb, above or below the fractured bone according to the amount of displacement. Some Thomas's splints are fitted with lateral pressure pads adjusted by a screw arrangement attached to the bars by means of which lateral deviations can be controlled.

Fractures of the Lower Third of the Shaft.

The interest in connexion with the treatment of these fractures is owing to the displacement of the lower fragment backwards as a result of the spasm of the gastrocnemii muscles. The upper fragment is usually adducted.

Again it must be pointed out that muscular spasm is only transitory, and Sir Robert Jones quotes an interesting case of compound fracture in which the limb was put in comfortable straight extension, and

the spasm was actually seen to pass off with the gradual disappearance of the flexion deformity of the lower fragment. Nevertheless, when the shortening has been reduced under an anæsthetic, by full extension, the Thomas splint should be bent to half a right angle at the knee before the tapes are secured at the end. A strip of bandage is kept tightly applied under the lower fragment to ensure gradual restoration of alignment. If backward displacement persists, which is unlikely, division of the tendo Achillis is indicated. When reducing the fracture I do not believe there is any real danger in applying full extension without flexing the knee (Fig. 7).

Fracture of the Shaft of the Femur in Children.

I have most experience in the oblique or spiral fractures of the shaft in children, and I was surprised to find in how many cases it was difficult to maintain a good reduction of the fragments. Whatever methods were employed, immediate X ray photographs showed a disappointing result; the final result was all that could be desired.

The Bryant suspension frame is not satisfactory in children over the age of 6 years, as the weight of the body tends to tear off the extension straps and frequent reapplication is necessary. When used in young children more traction will be obtained when only one limb is suspended, but the patient is more uncomfortable and the nursing is more difficult.

In a large series of cases described by Burdick and Siris^{*} the favourite method was a plaster spica and traction—118 cases treated. Bryant's frame and suspension was next in popularity—96 treated. Fourteen were treated with a Thomas splint and traction, and two with a Hodgen splint and traction. It was necessary in a few cases to resort to operation.

In my early days I operated on these cases, but subsequent experience showed that in the case of children an apparently bad primary result was followed by an extremely good final result, and X ray photographs taken a year or two afterwards barely indicated the line of the original injury. Not infrequently a child who was discharged from hospital with shortening ultimately presented itself with slight lengthening of the injured limb. In children, more than in others, it is necessary to emphasise the fact that perfect anatomical reduction is not essential for perfect functional recovery. There appears to be a stimulation of the growth of bone in its longitudinal direction, irrespective of the location of the fracture in the shaft.

One of the best methods of treatment is to place the child across a perineal prop, reduce the shortening, apply plaster strapping for subsequent extension, and over this a plaster spica from the malleoli to the ribs with the limb in moderate abduction. A weight-and-pulley extension of 10–15 lb. is employed. The plaster is removed in about six weeks. The continuous skin traction is used not so much to reduce shortening but to try and prevent any change in the relative position of the fragments. In children under 6 years of age extension of the leg in a vertical position to a horizontal bar over the bed is better than the method just described. A small Thomas splint—even small enough to fit a new-born child suffering from obstetrical fracture—also gives good results. A simpler method in infants is to bind the thigh and the extended leg to the front of the abdomen with a bandage. In the process of growth faulty alignment becomes corrected. Union is very rapid in these cases, and all fixation methods may be abandoned in less than three weeks.

A boy, aged 11, was admitted to hospital in 1921 with a transverse fracture of the humerus and a transverse fracture of the femur. Perfect alignment was obtained in the first instance with ease, by means of a Thomas splint, but later lateral displacement of the fragments occurred with $\frac{1}{4}$ in. shortening. The mother wrote to me in January,

1925, as follows: "He has had no trouble of any kind from it, and now plays football at school. There is no shortening or defect."

This is another illustration showing how absolute anatomical position is not necessary for perfect function; and displacements, when the alignment is correct, may be ignored even more so in children than in adults.

QUANTITATIVE DATA IN TISSUE REACTIONS TO ULTRA-VIOLET RADIATIONS.*

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On the purely physical side, the subject of ultra-violet radiation has been very thoroughly investigated, and a logical explanation is available for the behaviour of many inert substances under the influence of the rays. The same cannot be said of the physiological and therapeutic aspects of the subject, for, although certain striking effects are produced on living organisms as a result of exposure to the rays, there are still many processes of whose mechanism we have no exact knowledge.

It is well known, for example, that exposure to the rays frequently results in bronzing of the skin, due to increase of melanin granules in the basal cells of the epidermis. This fact has been associated with a coincident improvement of bodily fitness, and advantage has been taken of it in heliotherapy. At the same time, it is generally admitted by those who have studied a great number of cases that there are unaccountable variations in the response of different individuals to the action of the rays. Some patients pigment well and benefit greatly by treatment; some merely freckle and may not do so well; others again pigment not at all or only slightly, deriving but little benefit from the treatment, though this is by no means invariably true.

If investigation is carried out with a pure beam of ultra-violet rays, instead of employing the full solar spectrum, certain effects are rendered striking which would otherwise be masked.

Fluorescence Under Ultra-violet Rays.

Dr. Mottram and Prof. Russ¹ described in 1920, before this society, the curious appearances seen when objects are examined in a beam of rays from which the visible wave-lengths have been filtered off by means of Wood's glass. The following is a brief quotation from their paper:—

"The skin presents a generalised violet fluorescence, but, over the face and, to a less extent, over the rest of the body, dark non-fluorescent spots are seen, numerous in some individuals, almost absent in others. Freckled persons are usually thickly spotted, but, on the other hand, perfectly clear complexions may present a similar appearance. There are also to be seen, especially on the face, minute brightly fluorescent spots, having the appearance of stars."

Examination, in this way, of different skins under the ultra-violet beam revealed the fact that fair skins fluoresce more brightly than dark, and that the skins of dark races do not show a general fluorescence, but only over certain special regions. (The same applies to areas of artificially increased pigmentation, such areas being no longer as brightly fluorescent as before.) Thus, the same brightly fluorescent spots are to be seen on the face as in fair races, and the palms of the hands also present a fair degree of fluorescence.

Examination of the skin structures and derivatives shows that they may be divided into two groups—fluorescent and non-fluorescent.

* Read before the Section of Electro-Therapeutics of the Royal Society of Medicine, April 17th, 1925.

¹ Mottram, J. C., and Russ, S.: *Proc. Roy. Soc. Med.*, 1920, vol. xiii. (Section of Electro-Therapeutics), pp. 143–145.

^{*} *Annals of Surgery*, June, 1923.

The *fluorescent structures* are the following: (1) The keratinised layer of the epidermis; (2) the nails (or non-pigmented claws in animals); (3) white hair (or white fur in animals); and (4) the cornea and lens (derived from skin structures). Of the skin secretions, the sebum, the cerumen, and the vernix caseosa of new-born infants. Milk is also fluorescent.

The *non-fluorescent structures* are: (1) The pigment and pigmented epidermis; (2) pigmented claws (in animals); and (3) pigmented hair (or fur in animals). Of the secretions, the sweat is non-fluorescent. The blood is also non-fluorescent.

Of the above-mentioned constituents of the skin the sebum is the most brilliantly fluorescent, and its presence in the sebaceous glands probably accounts for the brilliant spots seen in the ultra-violet beam. Melanin in a state of purity and all melanotic tissues

with lard. The method of smearing the skin was in each case to apply a small trace of the substance to the area and rub it in gently, removing all excess by wiping dry with a clean towel.

Following this experiment, the protective power of vaseline was further investigated on similar lines. It was found that skin treated in this way by smearing with yellow vaseline is capable of standing three and a half times the length of exposure necessary to produce the same degree of erythema on normal skin. White vaseline is less protective than yellow, and shows less absorption spectrographically.

Skin Reactions in Relation to Intensity of Radiation.

The next series of experiments was undertaken with the object of seeing whether skin reactions run *pari passu* with physical measurements of the intensity.

The intensity of radiation from the mercury-vapour lamp is determined by the power consumption expressed in watts (obtained by the product of the current in amps. flowing through the lamp and the potential difference in volts between its terminals). When the power remains constant dosage depends on the time of exposure and the distance of the patient or object from the lamp.

Measurements of variation of the intensity of radiation with distance were made with a Furstenau (selenium) intensimeter, the power consumption of the lamp being kept constant at 396 watts. In this way the points on the full line curve in Fig. 2 were obtained. The thin dotted curves show the ordinary inverse and inverse square law curves, and it will be seen that, owing to the size of the lamp, the actual variation is not so rapid as from a point source.

Experiments were next made by exposing portions of normal human skin to the radiation at different distances ranging from 20 to 100 cm. The time of exposure for each distance was calculated from the data just mentioned, so that each corresponded to 1.5 E. (1 E = exposure at 30 cm. distance for two minutes with lamp consuming 310 watts and results in slight erythema in two hours and slight pigmentation in one week.)

The main result of these observations, given in detail in the table, was that, within the limits of

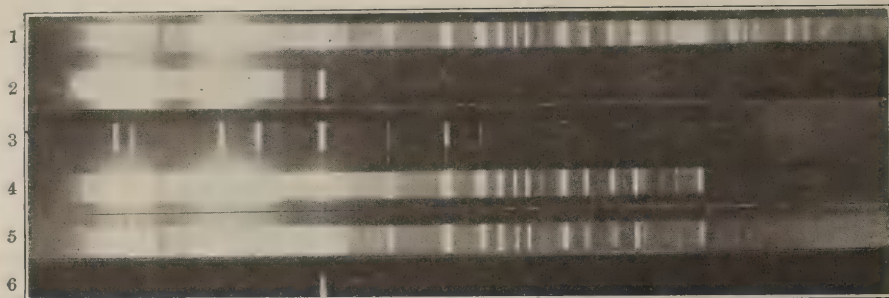
Table Showing Results of Detailed Observations.

Intensity (per cent.).	Watts.	Time.	Distance in cms.	Dose.	Erythema.	Pigmentation.
100	451	1'	20	1.5 E	+++	+++
67	"	1' 30"	30	"	"	"
43	"	2' 19"	40	"	"	"
27.8	"	3' 36"	50	"	"	"
18	"	5' 37"	60	"	"	"
12.3	"	8' 11"	70	"	"	"
10	"	10'	80	"	"	"
7.3	"	13' 45"	90	"	++	++
6.7	"	15'	100	"	"	"

1 E results in +++ erythema in 24 hours and ++ pigmentation in one week.

error of observation, the skin reactions were identical until the intensity was reduced to about 8 per cent., provided the time of exposure was correspondingly prolonged. Beyond this the effect was slightly less marked. The exposures were, of course, made on the same individual.

FIG. 1.



Absorption spectra, mercury-vapour lamp: 1. Unscreened. 2. Vaseline screened. 3. Lanoline screened. 4. Lard screened. 5. Empty cell. 6. Wood's glass, plus vaseline screen.

examined are completely non-fluorescent. Both melanin and sebum prove, on spectrum analysis, to be powerfully absorbent of the ultra-violet rays. When a body is said to fluoresce in a beam of pure ultra-violet, it means that a certain amount of the incident invisible beam is being converted into rays of longer and visible wave-length, and that the intensity of ultra-violet is reduced by this amount at least.

Fluorescence a Protective Phenomenon.

Fluorescence must, then, from the ultra-violet point of view, be a protective phenomenon. The following experiments were performed to substantiate this.

From a number of substances examined, three were selected: lard, lanoline, and vaseline (yellow). Lard is non-fluorescent. Lanoline fluoresces very like human sebum. Vaseline fluoresces very brilliantly. Absorption spectra were taken through 0.1 mm. thickness of each of these substances (Fig. 1).

It will be seen from these spectra that lard does not absorb the rays at all. Lanoline absorbs wave-lengths shorter than 2900 Å.U. Vaseline absorbs the whole ultra-violet spectrum, with the exception of the small band of wave-lengths from 3800-3650 Å.U.

The skin of the forearm was then examined by ultra-violet and an area of even fluorescence was selected. This area was covered by a perforated shield by means of which a series of small areas could be exposed to the rays. Over one area lard was smeared; over a second, lanoline; and over a third, vaseline. Two similar untreated areas were used as controls.

The arm was then fixed in position, 15 cm. from the centre of a Cowper-Hewitt mercury-vapour lamp, consuming 203 watts, and all areas were exposed simultaneously for five minutes. In one hour from the end of exposure erythema had developed over all areas except that smeared with vaseline. The vaselined area showed no sign of reaction, though the other areas developed pigmentation within a week, most marked in the control areas and in that smeared

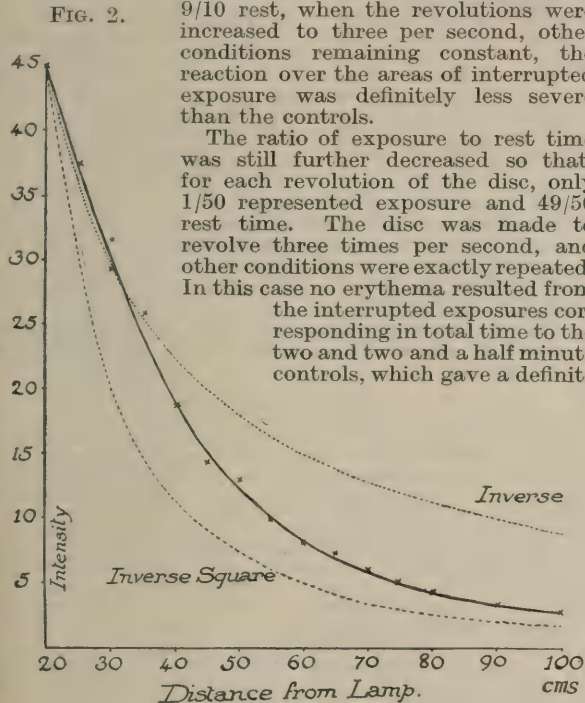
An attempt was made to obtain a direct skin reaction with rays of a particular wave-length by employing filters. A combination of Wood's glass and a vaseline cell showing spectroscopically absorption of all wave-lengths but a short band from 3800-3650 Å.U. was used (Fig. 1, No. 6). With this filter it was necessary to give 20 times the control exposure in order to get a faint transient erythema. It is possible that, in spite of the spectrographic evidence of the predominance of line 3650 Å.U., some shorter wave-length rays may have penetrated the screen and caused this effect.

Cumulative Effect of Repeated Small Doses.

The next thing investigated was the cumulative effect of repeated small doses. The method of investigation was to interpose a revolving disc between the source of radiation and the skin under examination. By variation of an aperture in the disc, different ratios of "exposure" to "rest" interval can be obtained and the frequency of exposure varied by the rate of revolution of the disc.

It was found that, with a ratio of exposure to rest interval of 1 to 1 a purely cumulative effect is produced. With 1/10 exposure to 9/10 rest, when the revolutions were increased to three per second, other conditions remaining constant, the reaction over the areas of interrupted exposure was definitely less severe than the controls.

The ratio of exposure to rest time was still further decreased so that, for each revolution of the disc, only 1/50 represented exposure and 49/50 rest time. The disc was made to revolve three times per second, and other conditions were exactly repeated. In this case no erythema resulted from the interrupted exposures corresponding in total time to the two and two and a half minute controls, which gave a definite



erythema within a few hours. The interrupted exposure corresponding to the three-minute control showed an erythema corresponding to the two-minute control. A further interrupted exposure of total time equal to a control of three and a half minutes resulted in an erythema corresponding to that of the two and a half minute control.

Thus it appears that, for the shorter exposures (two and two and a half minutes total time) a ratio of "exposure" to "rest" time of 1 to 50 does not result in a cumulative effect as far as erythema reaction and subsequent pigmentation is concerned; but the tissues have had the same actual exposure to the rays as would result in a definite burn if given as a continuous exposure. A continuation of observations with still further reduction of the momentary exposures is being made, but the times of exposure are necessarily very prolonged. Perthes² has shown that, when two doses of U.V. radiation are given

to the skin with a long time-interval between them, less reaction is produced than if the whole dose is given at one time.

The possibility of a constitutional effect of repeated exposure of rats to ultra-violet rays was investigated on the following lines:—

A group of 40 animals of similar age, size, weight, and colour was selected and divided into two sub-groups, 20 for experiment (Group I.) and the remaining 20 for control examination (Group II.). The males and females were segregated in each instance. The hair over the backs of the Group I. animals was cut short so as to obviate the dissipation of ultra-violet rays by fluorescence or heat production in the hair. These animals were exposed to the full radiation from the mercury-vapour lamp for five minutes daily at 50 cm. distance for 30 days. The power consumption of the lamp was 180 watts, giving a daily dose of $\frac{1}{4}$ E and a total dose of 7.5 E.

The animals in both Groups I. and II. received similar food and were housed under the same conditions as regards temperature, &c. Bi-weekly weight measurements show about 10 per cent. slower rate of growth in Group I. animals. At the end of one month the exposures were stopped, and one week later all the animals of both groups were inoculated with Jensen's rat sarcoma (J.R.S.) on the right side and with slow sarcoma on the left. Tumour measurements over a period of six weeks showed no appreciable difference between Groups I. and II. Thus it appears that, within the limits of the experiment, there was no constitutional effect calculated either to resist or favour tumour growth. A second series on similar lines gave the same result.

An attempt was made to find the lethal dose of ultra-violet rays for J.R.S. in vitro.

In view of the rapid absorption of the rays by the tissue, the sections of tumour must be very thin. To obtain a sufficiently thin uniform section to allow the rays to penetrate effectively, two razor blades were soldered to a metal handle so that the cutting edges were 0.5 mm. apart. With this double razor, sections were cut from actively growing tumours, care being taken to avoid any necrotic areas. The sections were laid flat, and, with due aseptic precautions, were treated as follows:—

Sections (a) were exposed to the full radiation from the mercury-vapour lamp.

Sections (b) were screened by 1.5 mm. of glass, to exclude the majority of the U.V. rays.

Sections (c) were set aside during the exposure and were used as controls.

A range of doses from 0.6 to 6 E was employed, the material being subsequently inoculated into batches of animals. When 6 E was reached all the (a) inoculations either failed to grow at all or grew small tumours for about ten days and then disappeared (0 per cent. growth). The (b) inoculations showed 33 $\frac{1}{3}$ per cent. of growth, while the controls (c) gave 66 $\frac{2}{3}$ per cent. growth. The lesser doses of U.V. rays allowed some growth in an appreciable number of cases, but 6 E was found to correspond to the lethal dose.

Conclusions.

From the foregoing experiments, it is, I think, possible to draw certain conclusions.

1. Since the skin surface is rendered visible by fluorescence, when only the invisible ultra-violet rays fall upon it, it is obvious that a greater or less amount of the incident rays is being dissipated at the skin surface as light and is consequently incapable of acting on any deeper structures.

2. Since fluorescence commences directly the skin is exposed to ultra-violet rays, whereas pigmentation only occurs as a result of considerable exposure, it is logical to suppose that, in fluorescence, we have a more immediate protection from excessive radiation, as far as ultra-violet is concerned, than in pigmentation.

² Perthes, G.: Münch. Med. Wochenschrift, Sept. 19th, 1924, p. 1301.

3. Since all the fluorescent substances examined, as well as the melanin which causes pigmentation, show marked absorption of ultra-violet rays, and since fluorescence and pigmentation always seem to vary inversely as each other, it might be interpreted that pigmentation marks the failure of fluorescence to protect the structures of the cutis vera from excessive radiation. This is substantiated by the experiments on artificially increased fluorescence, where no pigmentation followed exposure.

4. If pigmentation of the patient is aimed at as a standard of successful treatment, this is tantamount to producing deliberately in the patient a natural and efficient protection against the very source of treatment employed.

5. The pigmentation must be regarded as an indication that the penetration of the rays has not been prevented by fluorescence at the skin surface. If pigmentation could be avoided without hindering the penetration of the rays to the cutis vera it might prove more beneficial.

6. By employing the maximum dose which will on each application just fail to produce pigmentation, and, by separating the exposures by the minimum time-interval necessary to avoid the cumulative effect referred to, it should be possible to get equally good, if not better, therapeutic results in a shorter time.

I wish to thank Prof. Russ for his criticism and advice over many points in connexion with this paper, and Mr. D. B. Watters for assistance in measurements of intensity of radiation. My thanks are also due to Mr. S. J. Graham who kindly volunteered to submit to skin exposures in the majority of the experimental work.

SPIROCHÆTAL JAUNDICE IN GREAT BRITAIN.

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ALTHOUGH epidemics of spirochætal jaundice or Weil's disease seem to have been known from early times, especially during the Napoleonic and other wars, it was not until the discovery of the causative organism, *Leptospira icterohæmorrhagiae*, by Inada and his fellow workers (1916) that the disease could be distinguished with certainty from allied conditions. During the great war the occurrence of considerable outbreaks attended by a mortality varying in different localities from 4 to 10 per cent. brought this disease into prominence,¹ and the works on the subject, such as those of Dawson, Hume, and Bedson (1917), and Martin and Pettit (1919), have considerably added to our knowledge. It seems to have been generally assumed that this was essentially a war disease and, as far as we are aware, its presence amongst the civil population in this country has only been proved on three occasions.

The first case was that described by Manson-Bahr, Wenyon, and Brown (1922) of a bargee who apparently became infected as the result of having swallowed large quantities of Thames water. The first appreciable epidemic in this country which was proved pathologically was that which occurred amongst the Lothian miners described by Buchanan (1924). Finally Lyon and Buchanan recorded a small outbreak in children in Edinburgh which, in their opinion, was the result of infection being introduced by a child from the Malay States.

¹ In Japan a mortality of 57 per cent. has been recorded, but this seems to be very exceptional.

In spite of the foregoing observations being the only proved cases recorded in this country, we strongly suspect that the disease is much more prevalent than is commonly supposed. Cases of slight jaundice, especially in children, preceded by febrile symptoms are well known. The common diagnosis is influenza followed by jaundice, but in view of the results of the case which we have examined, we suggest the probability of these being mild cases of spirochætal jaundice.

We have recently had the opportunity of examining two cases of this nature, in one of which we were able to demonstrate the presence of the very characteristic leptospira in the patient's urine. These cases are particularly interesting, inasmuch as they were undoubtedly linked up with a small outbreak in a school in the Midlands.

Clinical Records.

The clinical course of the disease in these two patients was as follows.

Case A, a boy of 12 years, returned from school for the holidays early in April. Fifteen days later he complained of headache, and for two days his temperature was raised, on the third day there was no fever, but on the fourth day the temperature again rose to 101° F.; this was accompanied by persistent vomiting, marked distaste for any sweetened articles of diet, distinct smell of acetone in the breath, and the urine contained considerable amounts of acetone as evidenced by Rothera's test. The vomiting persisted for four days, then during the second week of the disease jaundice was well marked; this was accompanied by pain over the region of the right kidney, and on examination of the urine a heavy cloud of albumin and red blood cells were present; the nature of the disease was not suspected and no examination of the urine was made for the presence of leptospira. The treatment was entirely symptomatic, the acidosis being combated by rectal injections of glucose and bicarbonate of soda. During the second week epistaxis was a marked symptom. The symptoms gradually cleared up, and the patient made an uninterrupted but somewhat tardy recovery and returned to school.

It was then ascertained that several other cases of jaundice, 14 in all, had occurred amongst the boys from the school.

Case B, sister of the above, aged 8, who had been in close contact with the previous case, showed febrile symptoms exactly 30 days after Case A first became ill. There was three days' high fever during which marked photophobia and conjunctival congestion was present; jaundice appeared during the second week of the disease. From the eighth to the seventeenth day careful daily examination was made for the presence of leptospira in the urine. They were only once found—namely, on the ninth day; but on this occasion they were present in very considerable numbers, there being as many as three in a field of the centrifuged deposit.

The other significant symptoms in this case were as follows. Epistaxis occurred at intervals during the second week. There was, however, no vomiting and no hæmaturia, and although acetone was present from the third to the tenth day in large amounts in the urine, the albuminuria was very slight, only amounting to a distinct trace, and even that was not always present.

Animal Experiments.

Although certain of the guinea-pigs inoculated with the deposit from the centrifuged urine showed febrile reactions indistinguishable from those occurring in typical cases of this infection, we have not yet been able to recover the leptospira from the inoculated guinea-pigs.

Three guinea-pigs were inoculated with centrifuged urine on the eighth day of disease; one of these, which showed marked febrile reaction, was killed on the sixth day after the inoculation. Portions of the liver and kidney were macerated in normal saline solution, and two more guinea-pigs were inoculated with this suspension. Cultures from the heart blood, and from the saline suspension, were taken into Wenyon-Noguchi medium, but no growth of leptospira occurred. Two more guinea-pigs were inoculated with centrifuged urine on the eleventh day of disease; one of these showed a febrile reaction indistinguishable from a typical case of spirochætal jaundice in this animal. This was killed on the seventh day, and the kidney-liver suspension inoculated into two more animals.

Unfortunately no animals were inoculated on the ninth day of disease. Of the three which had been inoculated on the

previous day, one was showing a marked febrile reaction, and it was not then considered that the excretion of leptospira would prove to be such a transitory phenomenon in this case.

Source of the Infection.

It was found that four boys were admitted to the school sanatorium during the last week in March with symptoms very similar to those already described; also during the Easter holidays ten more boys suffered from a slight febrile condition, accompanied with jaundice in varying intensity and duration. Further, in addition to Case B, the sister of one of the infected boys also developed fever and jaundice. We therefore paid a visit to the school with the object of trying to discover some focus of infection. A similar outbreak in a school near Magdeburg (Körner, 1925) having been traced to infection through bathing, this possibility naturally occurred to us, but it was found that the school swimming tank had not been used by any of the boys during the last term.

Samples of water were taken from the storage tanks and also from the main water-supply, but in no case were leptospira found by direct examination of the centrifuged deposit. The cultures of the water from two storage tanks, however, revealed the presence of typical leptospira, but as these organisms have been found by one of us (E. H.) in water from many different sources, including London tap-water, its presence in this connexion does not necessarily throw any further light on the origin of this epidemic. The possibility of rats serving as a source of infection seems to be eliminated, as there was no record of any ever having been seen in the school buildings.

It is interesting to note that the four boys who first became ill during the term all occupied separate dormitories, and not one of the four was in the same form as the others. It would therefore appear that food or water was the most probable source of infection. As regards the chance of infection by food, there was a history of ambulatory indisposition in the case of one of the kitchen staff shortly before the boys became ill, but as 2½ months had elapsed before our visit, we were unable to obtain any more definite information on the nature of the illness.

Discussion of Results.

There can be no doubt that the cases which we have observed formed part of the general outbreak which originated at the school. We are led to this conclusion from the study of the history and clinical aspect. The incubation period in Case A was clearly a fortnight or more, a period which is considerably in excess of that usually observed in ordinary outbreaks of the disease. A similarly prolonged incubation period was also noticed in the case of some of the other boys, and this indicates that in mild epidemics, to which children seem to be specially liable, the incubation period may be as much as a fortnight or longer.

The clinical symptoms of both the cases observed by us closely resemble those described by Lyon (1925) in the Edinburgh epidemic last year. Acetonuria, epistaxis, and hæmaturia accompanied the jaundice and, in Case B, the conjunctival congestion mentioned by Stokes and Ryle (1916) and Martin and Pettit (1919) as being a feature of this disease.

The discovery of typical *Leptospira icterohæmorrhagiae* in the urine of Case B on the ninth day of the disease leaves no doubt regarding the diagnosis. We are well aware that spirochaetes of the *refringens* type have been found in the urine of normal individuals, but these bear no resemblance whatever to leptospira; with regard to *Spirochæta lorient* described by Pettit (1917) and Cristau (1917), which is apparently the cause of a very contagious spirochaetosis, the high incidence of jaundice in the epidemic which we have described seems to distinguish it from the epidemic at Lorient.

From the figures given by Pettit (1917) it is impossible to distinguish these two species on morphological grounds. The fact that we have been unable up to the present to recover the organism from inoculated guinea-pigs does not in any way negative the diagnosis,

for it is well known that when one is dealing with a comparatively non-virulent strain the chance of animal infection is remote. In the Edinburgh outbreak Buchanan (1925) only obtained one definitely positive result out of 44 animal experiments.

The main object of this paper is to emphasise the necessity of repeated examination of the urine for leptospira in all cases of undiagnosed fever followed by jaundice. This, however, can only be undertaken in a well-equipped laboratory, as a high-speed centrifuge and dark-ground illumination are essential. Finally, attention should be drawn to the infectious nature of the disease, and we suggest the advisability of adding it to the list of notifiable diseases, as from what we have heard recently there is some evidence that a mild form of this disease is widespread in this country.

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THE CHAULMOOGRA TREATMENT OF LEPROSY

AT THE HOSPITAL FOR LEPERS, DICHPALLI,
HYDERABAD STATE.

BY ISABEL KERR, M.B., CH.B. ABERD.

FOR the past four and a half years we have been giving the more recent preparations of chaulmoogra and hydnocarpus oil at this hospital, a mission institution which, in its erection and maintenance, owes very much to the enlightened generous policy of H.E.H. the Nizam and his Government.

Before the present treatment was adopted our inmates were mostly very advanced cases—men and women who, because of the deformity caused by the disease, were unwelcome in their homes. We could give them very little beyond general care, food, and clothing. They were unhappy because of their disease and we because of our ignorance of it. Such an institution achieves little or nothing in the prevention of the spread of leprosy, since most of the cases are past the infectious stages of the disease.

Methods of Treatment.

Early in 1921 we began the use of the ethyl ester of the fatty acids of hydnocarpus wightiana oil with creosote, camphor, and olive oil (E.C.C.O.), given under the skin or into the muscles. Of all the cases treated charts showing the condition of the patients were prepared—anæsthesia, nodules, discoloration, bacterial examination being recorded previous to treatment. Progress also was noted on successive similar charts. These were submitted to Dr. E. Muir, leprosy research worker of the Indian Government, Calcutta, with whom we have always worked in unison.

With the above preparation recent patches improved and nodules disappeared, but it was the general effect of this mixture which was most marked. It contained only a small percentage of ethyl ester. The exact composition was: Ester 1 part, camphor 1 part, creosote 1 part, olive oil 2½ parts, and the maximum dose, 5 c.cm. Previous to its administration our inmates were dull and apathetic, few of them slept, few had any appetite, and all were lethargic. The change was very marked; sleep and appetite returned and there was a general desire to move about and share in the normal activities of life. Both they and

we felt we had come to the end of the dark tunnel in which we had been living, and had begun to see light.

In order to check how much of the improvement was due to the creosote and olive oil we carried out a

We like to keep our patients, when we can, just on the point of reacting, even although we find that a reaction of 48 hours can bring about a great deal of improvement. Invariably we find that minimum doses of the E.C.C.O. 0.25 c.cm. brings down the temperature.

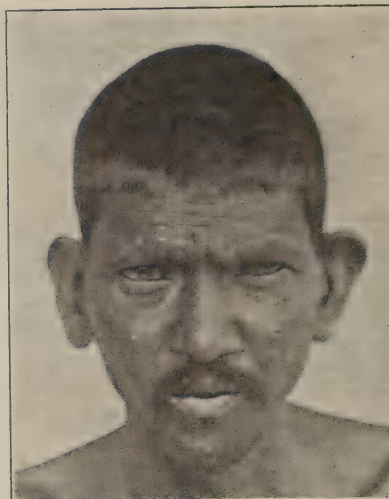
For this it is a valuable asset as well as for infiltrating old bone lesions which cause perforating ulcers.

Of course to achieve success we have been careful to get our cases uncomplicated. Concurrent disease, such as intestinal worms, malaria, syphilis, chronic gastric trouble, hinder the patient acquiring immunity. A quantity of medicine is wasted and prolonged inconvenience to the patient caused if these are not dealt with.

The more recent method of infiltrating the skin with the ester combined with creosote or thymol has given the quickest results with us at Dichpalli and, I believe, elsewhere. No inconvenience beyond a burning sensation for a few minutes at the points of injection is felt, and thus the patients are very keen about it. We infiltrate the lesions with the drug and paint over the surface with trichloroacetic



Before treatment.



After treatment.

control treatment at the same time with a 2 per cent. mixture of creosote and olive oil. With this, sensation returned in non-sensitive areas of not too long-standing, but positive lesions did not show improvement as they did with E.C.C.O.

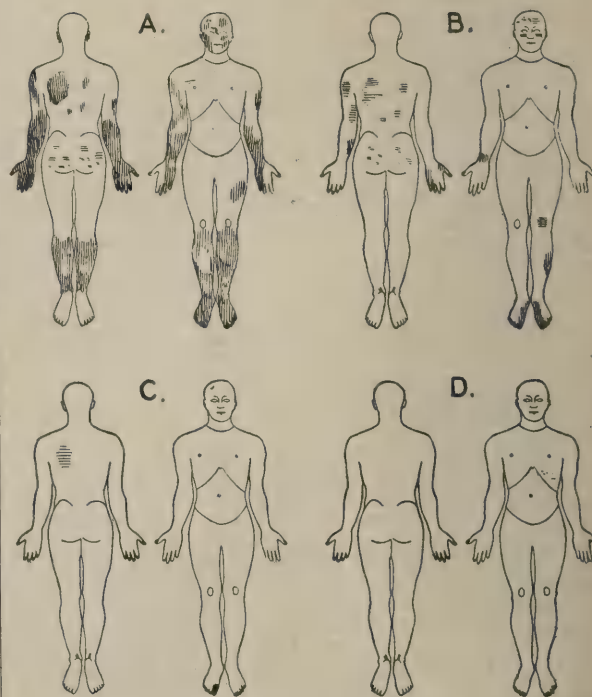
From E.C.C.O. we passed to more intensive treatment, giving the pure ester combined with creosote and iodine intramuscularly, and with iodine alone intravenously. In this way we could give up to 16 c.cm. a week. By this time, too, we had begun to get a better class of patients; the Railway Medical Service of the State and our mission hospitals throughout the district combed out from their employees and their schools infected people. As many of these were early cases, we had just the sort of patient who responded to treatment in a comparatively short time. The intravenous method, though more speedy in its result, was not popular with a few of the patients, since it caused a good deal of nocturnal coughing. It did so also during injection if not given very, very slowly. In some of the acute skin ("nodular") cases it was difficult to give in small enough dose to avoid aggravating the disease, but the skin cases who could take the large doses, either intravenously or intramuscularly or both, did very well. The lepra bacilli, lying as they do as emboli in the fine capillaries, can be reached through the blood-stream. In nerve cases the organisms are more difficult to reach. With them results were not so marked. However, of the reports and charts we submitted to the Leprosy Research Department, Calcutta, 66 per cent. of our cases showed "very much improvement," and of these 12 per cent. had become symptom-free.

I may say at this point we accelerated the effect of the ester by the use of Kedrowsky vaccine. Dr. Muir kindly supplied us with slants of the "lepra bacilli" from which we had vaccines prepared. This started cases reacting (i.e., getting evening temperature) after they had seemed callous to the ester.

Occasionally one finds a case which cannot take this treatment. One we had was a young man of 25 who had suffered from constipation from his childhood, had hæmorrhoids, and a liver which refused to function. Under such conditions it was impossible to coax even the beginnings of immunity without causing a violent reaction which was difficult to stop.

acid. Early cases show improvement within a few weeks; older lesions naturally need longer time. Very old nerve lesions, where the nerve-endings are dead, cannot improve. The scars may disfigure the patient, but, being non-infective, they can no more

FIG. 3.



Effects of modern treatment in an early case of leprosy.

A, on admission (1/6/21). Showing erythematous patches of imperfect sensation; lepra bacilli in nasal discharge. B (1/2/22). Showing discoloration of old patches and some small insensitive areas. C (30/3/22). Discoloured patch on back and small insensitive patch on toe. Nose shows broken-up bacilli. D (16/8/22). Patient symptom-free. Wassermann test negative.

convey leprosy than, as Dr. Muir has put it, can small-pox pitting convey small-pox.

When a lesion is infiltrated we find that not only is there improvement locally, but also in the distant lesions. The irritation caused by the drug breaks up the bacilli which throw out their toxins. Those again make antitoxins which break down bacilli elsewhere. By infiltration we can give whatever amount of the ester a patient can take. As much as 20 c.cm. can be given a week and even more. We generally give part of a large injection into a muscle.

This short article would be incomplete without reference to a control treatment we carried out for two years with the esters of linseed and olive oil. This was done at the suggestion of the Calcutta leprologists. With a few cases—mostly nerve leprosy—improvement followed, but not so marked as with the chaulmoogra series. All these oils are unsaturated, but linseed and olive oils do not belong to the carbon ring series as do the latter. As leprologists tell us, we need both qualities in then treatment of leprosy, and our control treatment bears this out.

Results.

Out of 180 patients treated with hydnocarpus ester during 1923 and 1924 the following statistics were drawn up: 17 per cent. symptom-free; 45 per cent. very much improved, most of them likely to become symptom-free; 35 per cent. improved; 3 per cent. worse or dead. Of infective cases 63 per cent. have become non-infective.

In all skin cases the effects of treatment are gauged by microscopic examination of skin and nose. It is important with such patients that the treatment should be as intensive as possible. If it is slow the nerves may become affected, and the treatment would be unnecessarily prolonged.

On admission a number of our patients suffer from acute toxæmic symptoms—temperature and pain along the nerve trunks. This is especially marked if the disease is not advanced. Even with the minimal doses, which one has to give to avoid aggravating the temperature, the neuralgic symptoms disappear almost as if a dose of morphia had been given. When the progress of the disease has been stayed the patient's immunity increases and we are able to give larger amounts of the drug. The results then depend on patience, care, and time. Two complications for which we have to be on the look-out are tuberculosis and nephritis. The symptoms of tubercle are often so completely masked by those of leprosy that the first announcement of its presence may be acute tuberculosis of the intestinal or meningeal type.

The series of diagrams, A to D, show what may be expected in an early case of leprosy which had just passed into the infective stage. There was obstruction of the right nostril, occasional bleeding, and acid-fast bacilli in smear. The symptoms appeared concurrently with an attack of syphilis. The longitudinal shading represents loss of sensation; horizontal shading discoloration. The patient was under intensive treatment for 15 months. Then he returned to normal life and work, coming to us for a time for weekly injections. He has kept perfect health for three years.

LECTURES ON CHILD WELFARE.—The National Association for the Prevention of Infant Mortality and for the Welfare of Infancy has arranged a special course of lectures for health visitors, voluntary workers, teachers, nurses, &c., to be held at University College, Nottingham, from Sept. 21st to 25th. The syllabus includes such lectures as the Nervous Child, by Dr. Eric Pritchard; the Care of the Adolescent Girl and the Home Care of the Mentally Deficient, by Dr. Letitia Fairfield; the Prevention of Difficulty in Labour, by Dr. J. S. Fairbairn; Ductless Glands and Vitamins, by Dr. J. Stanley White; and Warnings of the Abnormal in Labour, by Lady Barrett. Visits to clinics, sanatoriums, and dwellings will also be included. Full particulars may be obtained from the Honorary Secretary, 117, Piccadilly, W.1. Early application is advisable.

TWO CASES OF CYSTINURIA IN CHILDREN,

WITH RENAL AND VESICAL CYSTIN CALCULI
RESPECTIVELY.

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CYSTINURIA is a rare family and hereditary abnormality in the metabolism of proteins,¹ in which the sulphur-containing amino-acid, cystin, a normal product of the hydrolysis of proteins, is excreted in the urine to the extent of half a gramme in the 24 hours. It is found in the child, and persists throughout life.² Cystin may give rise to urinary deposits in acid urine in the form of colourless hexagonal plates and may form calculi. The deposit alone, however, will not form calculi, but is only a factor in their formation.³ Apart from the liability to form calculi, the excretion of cystin has apparently no ill-effect; thus Abderhalden⁴ says: "The metabolism of a cystinuria patient is always normal, and urinary stones are frequently found in the disease." Macalpine,⁵ who removed six cystin calculi from the kidney of a boy aged 8 years, noted that the urine of cystinurics on decomposition had a foul odour, possibly due to the sulphuretted hydrogen produced during the decomposition of the cystin, which contains practically all the sulphur of proteins.

The calculi are of a yellow appearance, and assume a greenish waxy appearance after removal. They are often multiple and bilateral, and may be found either in the kidneys or bladder, and are prone to occur in several members of the same family. They usually cast a fairly dense shadow with the X rays. Case 1, here reported, gave excellent shadows. Graves,⁶ however, reported a case in an obese woman of 26 with unmistakable clinical signs of calculus in the kidney, which failed to reveal a shadow on two occasions. It was finally shown by a pyelogram. He points out that cystin, being an amino-solid, would not be expected to give a shadow unless mixed with inorganic substances. Thomson-Walker³ says that "cystin and xanthin calculi cast a shadow only slightly less dense" than oxalate of lime calculi. Graves, however, admits that the general opinion of most writers is that they readily give a shadow, and quotes Müller,⁷ who reported a case of a man, aged 21, who persistently formed cystin calculi which gave shadows with the X rays. He also refers to Morris's⁸ paper on the X Ray Shadows of Cystic and Xanthic Oxide Calculi. Morris said that many cystin calculi contain phosphate of lime and traces of magnesium and ammonium phosphate, but what was more to the point, cystin contains 25.53 or 25.81 per cent. of sulphur, and therefore it was improbable that they could fail to cast a very deep shadow. He reports a case in a patient, and refers to specimens in the Museum of the Royal College of Surgeons of England.

Frequency of Occurrence.

As regards the frequency of occurrence of cystin calculi, Tennant,⁹ in his paper on cystin calculi, says that until 1882 only 50 cases had been reported. He refers to Kretschner's¹⁰ comprehensive study on cystinuria and cystin calculi in 1916. He (the latter) found 107 cases of stones, including two of his own in twin boys aged 9 years. Vesical calculi were present in both the twins and were diagnosed before operation. Tennant also refers to Watson and Cunningham,¹¹ who reported one case in 32 cases of cystinuria, to Morris¹² two in 77, and to Sir Henry Thompson three in 114. Calculi, therefore, occur in about 2-3 per cent. of cystinurics. Although rarely, calculi may occur in old age. Möerner¹³ reported a vesical cystin stone successfully removed from a man aged 69.

As regards the families of the two cases here recorded, a baby sister of Case 1 is cystinuric, but

other members of the family, including both parents, are free from this anomaly. A brother of Case 2 passes urine containing cystin, but the urine of the mother (father deceased) contains none. It may be noted¹⁴ that the urine must be acid for the deposition of the crystals, and if not acid must be rendered so by the addition of a few drops of acetic acid.

Cystinuria is of interest to the surgeon on account of the complex surgical problem that is presented so frequently by the multiplicity of the calculi and by the persistence of their re-formation after removal. These two factors are responsible for serious damage to the renal function, and establish thereby a grave operative risk. Thus Tennant,⁹ in his paper referred to above, reported a case of multiple cystin calculi in a woman aged 21, on whom he performed three major operations, removing 15 large stones of an aggregate weight of 73 g., and involving both kidneys and one ureter. There were two in the right kidney, one in the left, and a series of 12 in the right ureter. The function of the right kidney was low, as shown by the phenol-sulphonaphthalein test. She recovered, but continued to deposit cystin crystals in the urine. Müller,⁷ in his paper already quoted, gives the history of a young man of 21, who formed cystin calculi with ungovernable persistence.

CASE 1.

Case 1 is an illustration of the surgical problem with which the surgeon may be faced. This case was under the care of Mr. George E. Waugh at the Hospital for Sick Children, Great Ormond-street, to whom I am indebted for permission to publish it, and whom I have to thank for many suggestions and much helpful criticism in the preparation of this paper.

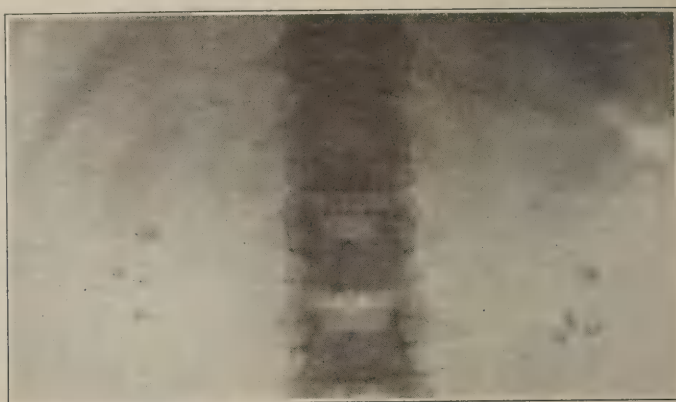
CASE 1.—K. H., girl, aged 9⁹/₁₂ years, was admitted to hospital on March 20th, 1922, with a history of pain in the right side for about a year, and occasional hæmaturia after running about.

Past and Family Histories.—Nothing of note, but subsequently in February, 1924, a baby sister was found to be passing cystin.

Condition on Admission.—She was a pale but well-nourished child. Right kidney easily palpable. No oedema of the extremities or puffiness under the eyes. Urine: Pale, turbid, acid; sp. gr. 1012; albumin, slight cloud;

1922): Maximum urea concentration of 1.7 per cent. Cystoscopy (March 31st): Nothing abnormal. Ureters catheterised. 2 P.M., 4 c.cm. of 4 per cent. indigo-carmin given intramuscularly. 3.40 P.M., coloured urine from right kidney. 6 P.M., tinge of colour from left kidney. Segregated urines: Urine from right kidney, urea present in considerable

FIG. 2.



Case 1.—Skiagram, July, 1922. Calculi remaining after both operations, and before administration of sod. bicarbonate. (Cf. Fig. 3.)

quantity; urine from left kidney, urea present in minute quantity. Conclusion: Right kidney, fair efficiency, 60 per cent. of normal; left kidney, poor efficiency, 10 per cent. of normal.

First operation (April 7th): Left kidney (more damaged one). Usual lumbar incision. One large branched calculus, about five or six smaller ones, and many minute calculi were removed from the pelvis of the kidney, which was considerably dilated, the amount of kidney substance being considerably reduced. Difficulty was experienced in removing the smaller stones from the dilated calyces. The pelvis contained purulent urine and was irrigated with 2 per cent. chloramine in saline and closed with drainage. During the operation the parietal wound was protected with gauze wrung out in 1 in 40 carbolic acid to avoid infection.

Pathological report on calculi: Cystin calculi; the large branched one weighed 15.50 g. Urine: Cystin crystals found in the deposit.

Urea-concentration test (April 24th):—

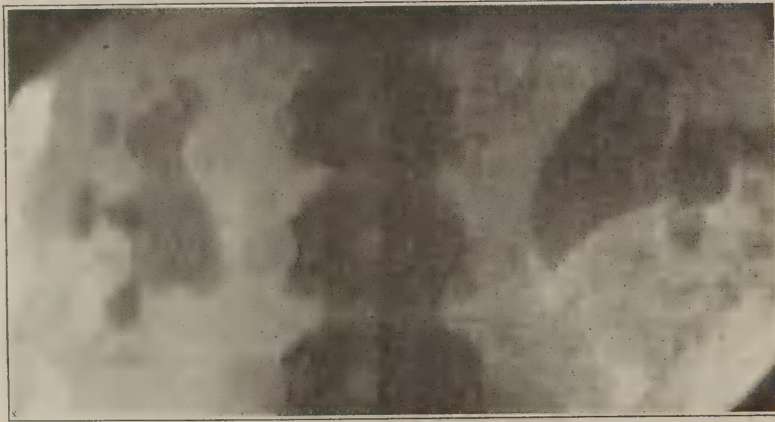
	Patient.	Control.
24-hours specimen	0.6 per cent. urea	1.8 per cent. urea.
Grammes vi. urea given:—		
6 A.M.	1.7 " " "	2.9 " " "
7 A.M.	1.4 " " "	3.1 " " "
8 A.M.	1.3 " " "	3.2 " " "

Skiagram (May 18th): Several small stones still remain in the pelvis of the left kidney.

Second operation (May 19th): Right kidney. A similar operation was performed, and the same condition found as in the left kidney; but the kidney was not so dilated. Large branched calculus, weighed 6.40 g. After both operations there was considerable hæmaturia for some days, which, however, cleared up without trouble, and the wounds healed soundly after removal of the drainage-tubes, without becoming infected. July 5th, numerous minute calculi passed during the last month. Skiagram: Several small calculi remain in the pelvis of both kidneys. Ureters and bladder free. (Fig. 2.) Urea-concentration test: 24 hours specimen, 1.1 per cent. urea; 4 A.M., 1.4 per cent. urea; 5 A.M., 1.8 per cent. urea; 6 A.M., 1.8 per cent. urea. Oct. 9th, passing small stones at intervals, sometimes hæmaturia. Skiagram: No change since July. Urea-concentration test: Maximum urea-concentration, 1.8 per cent. Diet: Fish; sod. bicarb., gr. 120 daily.

February, 1923: Occasional severe headache, occasionally passes a small stone. Urea-concentration test: 24 hours specimen, 1.75 per cent. urea; 6 A.M., 1.45 per cent. urea; 7 A.M., 1.70 per cent. urea; 8 A.M., 1.80 per cent. urea.

FIG. 1.



Case 1.—Skiagram, March, 1922. Calculi before operation

no sugar. Blood cells, occasional pus cells, and granular casts present. Blood pressure: 123 mm. Hg. Wassermann reaction: negative. No retinitis. Skiagram: One large calculus and several smaller ones in the pelvis of each kidney (Fig. 1). Urea-concentration test (March 24th,

February, 1924: General condition improved, and she is growing. She attends school, but still has severe headaches which keep her away on occasions. Has not passed any stones for fully six months.

Urea-concentration test:—

	Urea per cent.	Urine.
Twenty-four hours urine ..	1.31	508 c.cm.
First hour	1.50	90 "
Second hour	1.40	150 "
Third hour	1.58	90 "

Urine contains cystin crystals, no casts; cultures sterile. Skiagram: Now remaining, one large and one small calculus in the left kidney. (Fig. 3.)

December, 1924: Condition excellent, attends school regularly. Cystin crystals still present, but as precipitation. Diet restricted still and 120 gr. sod. bicarb. daily.

Comment.

The urea-concentration test, the indigo-carmin test, and the analysis of the segregated urines, showed a low renal efficiency and therefore a bad operative risk. It was, however, essential to attempt removal of the stones, the alternative being inevitable death within a comparatively short period.

The surgical problem presented was the question as to which kidney to operate on first. To operate

FIG. 3.



Case 1.—Skiagram, February, 1924, showing effect of administration of sod. bicarbonate. (Cf. Fig. 2.)

upon the more efficient kidney first with a view to arresting further damage to the renal structure as quickly as possible, would appear to have been the operation of choice. But the fear that suppression of urine might follow the first operation was responsible for the decision to deal with the less efficient kidney first, thus leaving the more actively functioning kidney to bear the brunt of a possible post-operative complication. The subsequent after-course of the patient threw no light upon the wisdom of this decision. She did remarkably well after both operations; at no time did her condition give rise to anxiety, neither were there any signs of impending uræmia. No doubt this favourable result was largely due to careful nursing and dieting.

There was a measure of doubt as to whether the stones in the left kidney shown by the skiagram taken in May, 1922, just before the second operation, and in both kidneys in July and October, 1922, had been left behind at the operations, or had re-formed in the meantime. The skiagram in May was taken about six weeks after the first operation, and that in July about two months after the second, which seems a very short time for the calculi to have re-formed. But she was not put upon large doses of sod. bicarbonate daily until October, 1922, which is said to increase the solubility of cystin. It seems hard to confess that any stones had been left behind after the very thorough manner in which the calyces had been explored and irrigated. The skiagram taken in February, 1924, shows that she has been passing

these stones, so that the sod. bicarbonate appears to have been of considerable value. The urine, however, still contains cystin crystals.

Prognosis.

Although the patient is lucky to have recovered from two severe major operations on such damaged kidneys (Kürster gives the mortality for double calculi as 35 per cent.), the ultimate prognosis cannot be very favourable. The urea-concentration test in February, 1923, shows very little improvement indeed in renal efficiency, while that of February, 1924, is distinctly disappointing; considering she has passed the majority of the stones remaining in the kidneys, one had hoped for an improvement in renal efficiency, more particularly as she has improved in general health, and is growing.

Apart from her renal efficiency, her present condition is encouraging, but the restricted diet and sod. bicarbonate must be continued. Should she form any calculi of such a size as to call for removal, operations on such damaged kidneys would be attended with very grave risks indeed.

The mother gives the following history of a sister of this patient:—

M. H., girl aged 1⁸/₁₂ years. Since July, 1923, has had attacks of abdominal pain accompanied by profuse sweats. She doubles herself up and presses the hands over the pubes. Each pain lasts from three to four minutes, and may occur several times daily. The relation to micturition has not been noted, and no blood in the urine has been seen. While under observation in the ward for a week in February, 1924, the attacks of pain were not noticed, but she appeared to have some retention on occasions. The urine was acid, contained an abundance of cystin crystals, and *Staphylococcus albus* was grown from a catheter specimen. A skiagram of the urinary tract was negative.

CASE 2.

Case 2 is that of a boy who was under the care of Mr. O. L. Addison at the Hospital for Sick Children, to whom I am indebted for permission to publish it.

C. H., boy aged 2⁷/₁₂ years, was admitted to the Hospital for Sick Children on Sept. 15th, 1922.

History.—Twenty-one months ago he started screaming when passing water; attacks of pain came on every two weeks at first, more frequently lately. He was always soaking his napkin. He passed a very little bright blood on two occasions in March or April, 1922, and for six weeks during March and April he had a urethral discharge. He was circumcised when six weeks old.

Family History.—Brother, E. H., aged 9, has had an operation for stone in the bladder elsewhere, which was not chemically examined. Father died from heart failure. Skiagram: Large vesical calculus. Cystoscopy (Sept. 21st, 1922): Stone seen, also two ulcers. Edematous and inflamed mucous membrane. Bladder contracted. Suprapubic lithotomy: Stone size of a pigeon's egg removed. Drainage-tube inserted. Pathologist's report: Cystin calculus weighing 8 g. The drainage-tube was removed on Sept. 28th, and the boy discharged with the wound healed on Oct. 17th.

Readmitted on Oct. 28th, 1923, for "inability to pass water." Since discharged last year has been quite well, but recently has been wetting himself more than previously, having frequency at least every hour by day. Stream has always been good. Oct. 27th, 1923: Only a drop or two of urine would come away. A doctor passed a catheter and sent him to hospital. While being carried to hospital he had an attack of screaming. Mother examined him and found that two small stones had been passed. In the ward he appeared to be quite comfortable. Bladder was not distended. The stones were the size of a split pea, hard, and brittle. Skiagram (Oct. 3rd, 1923): Bladder and kidneys—no abnormality, ? doubtful shadows left kidney region. Passing urine freely. Urine: culture from deposit: first day, streptococci isolated; second day, few colonies. *B. proteus* grown. Report on calculi: Calcium oxalate and triple phosphate, trace of alkaline earths. No cystin. Cystoscopy (Nov. 1st): Slight cystitis. Area of left ureteric orifice inflamed. No stones seen. Skiagram (Nov. 5th): Very small shadows in left kidney region. January, 1924: Still has frequency, wets himself often. Urine deposit: Chiefly oxalate crystals, few cystin crystals. February: Put on sod. bicarb., gr. 45 daily. March: Has passed two more small calculi which the mother did not keep. Skiagram (March 22nd): Fairly large calculus in left kidney. December: Still wets himself. Passed some "sand" in

September last. Calculus little larger but still of a size possible of being passed. Still on sod. bicarb., gr. 45 daily.

Comment.

This case is remarkable in that the boy forms oxalate calculi as well as cystin, and that the urinary deposit contains chiefly oxalate crystals, only a few cystin crystals being found. In the literature I have searched, I have not found a case in which other calculi as well as cystin calculi have been formed.

Prognosis.

Unless this patient succeeds in passing the calculi now in his left kidney, it is evident that sooner or later they will have to be removed. Being a boy, he is less likely to pass them as the girl has done. Moreover, his bladder is infected, and, with the calculi, progressive loss of renal efficiency will ensue. That he forms two different sorts of calculi also complicates matters. But he has come under treatment before serious damage to his renal function has occurred, and so his outlook in life is considerably better than the girl's. E., the brother of this patient, who had a vesical calculus removed elsewhere four years ago, has no symptoms now, and a skiagram of his urinary tract is negative. His urine, however, contains cystin crystals. I think it, therefore, justifiable to assume that his calculus was of this composition. He has now been placed on sod. bicarbonate gr. 45 daily, with a view to preventing, if possible, any re-formation of cystin calculi.

SUMMARY.

Cystinuria, when complicated by the formation of calculi, is undoubtedly a very serious disease, both on account of the multiplicity of the stones and the serious damage to renal function caused thereby, and also on account of the persistence with which they continue to be formed. Their formation can evidently be controlled to a certain extent by the administration of large doses of sodium bicarbonate; but it is said to be largely independent of diet. Since only 2 to 3 per cent. of cystinurics form calculi, cystinuria cannot be looked upon as a very serious potential danger to life, and apparently 97-98 per cent. of these individuals go through life without suffering any disability at all from their abnormality in protein metabolism. It is possible, on the other hand, that, with the increase of biochemical investigations carried on in this branch of medicine, more unsuspected cases of cystin calculi may be discovered, since calculi have not always been subjected to analysis and the yellow appearance of cystin calculi at the time of removal may suggest a uric acid or urate composition. It is not until after exposure for some time to the air that they assume their characteristic greenish waxy appearance.

Since writing this paper Edwards¹⁵ has published an interesting case of cystinuria with calculous formation, in whom the passage of cystin crystals was intermittent. Repeated specimens of urine gave no deposit of crystals after acidifying with acetic acid and acetone, and the chemical reactions of cystin were absent. The specimen containing crystals was darker and more oily than those without the crystals and yielded a heavy deposit. The familial nature of the disorder is also strongly brought out in his case, and a study of the family further emphasises the serious damage that can be done to the kidneys as well as the multiplicity of the stones that may be formed—over 200 having been found in the enormously enlarged kidney removed from one sister.

As regards the density of the X ray shadows of cystin calculi being dependent on the sulphur they contain, Winsbury White¹⁶ states in a recent paper that cystin and xanthin calculi give poor shadows when in the pure state, but of slightly more opacity than those of urates, uric acid, and triple phosphate owing to the sulphur they contain.

Edwards also makes some suggestions as to treatment. He says that choleic acid may be given on the

hypothesis that endogenous cystin is excreted because of the lack of choleic acid with which it should normally conjugate to become the taurin of the bile-salts. Intestinal and urinary antiseptics, he says, should be given to allay the pelvic infection which furnishes the irreversible colloid that glues the crystals into calculi. Vaccines prepared from faecal strains for this purpose he did not find of much benefit. He also refers to Klemperer and Jacoby, who state that the administration of 6-10 g. of sodium bicarbonate causes the complete cessation of cystinuria. Where stones have already been formed this is of no value, but in the two cases here described the large doses given seem to have been of distinct value, in any case in controlling the formation of calculi.

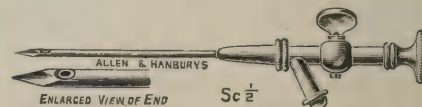
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New Inventions.

AN IMPROVED REFILL NEEDLE FOR ARTIFICIAL PNEUMOTHORAX.

THERE are certain disadvantages in the refill needles commonly used in cases of artificial pneumothorax. The Lillingston needle is difficult to push through the skin. The Saugman needle is very apt to



punch out a piece of skin. This can easily be cleared by squeezing the tube, or inserting the stylette through a stuffing box, but it is a nuisance, and theoretically it is wrong to push the piece of punched-out skin into the pleural space. I have, therefore, asked Messrs. Allen and Hanbury to make for me the needle herewith illustrated. It works extremely well. The point is an ordinary sharp-cutting trocar point; the outlet hole is situated laterally. It can only be used, of course, when there is an appreciable pneumothorax.

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London.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF SURGERY.

WEDNESDAY, JULY 22ND.

CARCINOMA OF THE STOMACH.

IN opening a discussion on this subject Sir William I. de Courcy Wheeler reminded the meeting that 10,000 people died annually in the British Isles from this condition. He proceeded with a destructive criticism of the method of diagnosis by analysis of the gastric contents which, in his opinion, did not lead to any definite goal, nor did he consider the fractional test-meal productive of encouraging results. The greatest advance in diagnosis lay, he said, in accurate X ray examinations; though even here one must not expect the miraculous. He referred to the occurrence of venous thrombosis as a valuable sign of early carcinoma of the stomach (Prof. T. G. Moorhead), and cited four cases where its value was illustrated. The speaker was of the opinion that if there was no gain in weight, or at least maintenance of weight, after efficient medical treatment, malignant disease should be suspected and exploration was then more than justified. He recognised a definite "pernicious anaemia type" of carcinoma of the stomach, and held that should such cases not respond very rapidly to treatment by arsenic, malignant disease should be suspected. In dealing with the differential diagnosis, syphilis and gastric disturbances in pulmonary tuberculosis, diabetes and actinomycosis, were described as conditions likely to be confused with malignant disease of the stomach.

Proceeding to the question as to whether gastric ulcer was or was not a precursor of carcinoma, the speaker instanced several cases of undoubted implantation of carcinoma on a chronic ulcer, but admitted that most cases of carcinoma on which he had operated arose without symptoms which would suggest the presence of a previous ulcer. He did not believe that palliative operations were of much value. The value of radium in the treatment of carcinoma was undoubted. The two-stage operation for removal of the carcinoma was seldom, if ever, necessary, and he found the shock from gastrectomy of the Mayo-Moynihan-Polya type to be surprisingly small. Sir William Wheeler then described a very interesting case, in which he had removed, apparently, the whole stomach for a non-malignant ulcer. His address was illustrated by slides and X ray photographs.

Dr. E. I. Spriggs spoke of the

Clinical Manifestations and Early Diagnosis

of cancer of the stomach, excluding the use of laboratory methods. He first gave an account of the classical symptoms—vague discomfort occurring in elderly men, with gastric flatulence and loss of appetite gradually developing into nausea, eructation merging into vomiting, pain either in the pit of the stomach, the small of the back, or between the shoulders; then later, a tumour, loss of weight, colour, and vigour; and finally, ulceration, coffee-ground vomit, mild irregular fever, involvement of other structures, and death in two years. He compared these symptoms with those described in 25 chosen cases, in which a very full history was obtained. In 17 the history was recent; in four it was long. The history of old indigestion, he pointed out, must not be allowed to obscure the diagnosis. Dr. Spriggs compared the symptoms according to the part of the stomach involved. In cases where the carcinoma was situated at the cardiac end, eructation was more common than in other types. After a time the symptoms gradually merged into those of oesophageal obstruction. In cases of the "leather bottle" type, the patient early complained of an aversion to food. When the neoplasm was situated at the pyloric end of the stomach, there was always pain after food, which might, or might not, be relieved by more food. The history was never

clear-cut. Vomiting of large quantities of food at intervals of two or three days, he considered, was a very rare sign in cases of malignant disease. In three of his cases hæmatemesis was the first evidence of the presence of malignant disease. An anxious expression was sometimes present, and, if present, was sufficiently characteristic to be an aid to diagnosis. Finally, the speaker expressed his opinion that the first most vital step towards a diagnosis of carcinoma was not the clinical study of the patient. He believed that investigation should be carried out at once—that there should be no "watching"—and that carcinoma should be excluded at the earliest possible moment. X ray examination he considered the most important. All examinations should be very complete, and if the diagnosis was still in doubt an exploratory operation should be performed.

Dr. A. F. Hurst dealt mainly with the methods of investigation of the patient. He strongly urged that doctors should send their patients early to the radiographer, and that patients should be encouraged to come early to their doctors, even for vague pain. He discussed the methods of examination of the stomach content, chemical and microscopical. With reference to the examination for pus, he recommended routine examination of the "spittle." He considered that the presence of blood in every part of a fractional test-meal was evidence of malignant disease unless there had been a recent hæmorrhage from an ulcer. He was of the opinion that a skilled radiographer could show an abnormality of the stomach in 100 per cent. of cases of malignant disease. A fallacy was present if the stomach was not empty when the examination was made, for the barium might then appear low down, because it had sunk to the bottom of a full stomach. Occult blood was present in 100 per cent. of cases and the examination for its presence was of the utmost importance. It was never present in normal people, and although it was found in patients suffering from a gastric ulcer that condition could be distinguished by X ray examination. Examination of the blood for megalocytosis was important in the differential diagnosis of pernicious anaemia. Dr. Hurst showed slides illustrating this point and described a method of measuring the cells.

Pathology of Gastric Carcinoma.

Prof. M. J. Stewart dealt with the pathology of carcinoma of the stomach, the relation of ulcer to carcinoma, the mode of spread of the carcinoma, and the frequency of secondary deposits in the liver. He presented an analysis of 165 cases examined in the post-mortem room. Of these, 82 per cent. were between the ages of 40 and 70, and the proportion of males to females was 2 to 1. His address was illustrated by a series of microscopical specimens showing sections of chronic ulcer and of malignant disease. In a series of 216 clinical specimens of gastric ulcer and carcinoma 9.5 per cent. showed carcinoma implanted on a chronic ulcer.

Dr. Gregory Cole (New York) said that five years ago it was taught in America that 68 per cent. of cases of gastric ulcer became malignant. In one-tenth of the ulcer cases he had seen in the last ten years he could not say whether they were malignant or not, in the remaining 90 per cent. he had only seen one in which carcinoma developed in the neighbourhood of a chronic ulcer.

Mr. John Morley, although he considered the idea that carcinoma was often implanted on a chronic ulcer attractive and that it would lend point to the advice to patients to be investigated early, nevertheless doubted its truth. He drew attention to the possibility of a mistake in microscopical diagnosis in those cases where, as had been pointed out by Sir Bernard Spilsbury, there might be proliferation of cells at the edge of an ulcer. Where the history of indigestion was recent—under 12 months' duration—there was a strong likelihood of the presence of malignant disease. He was of the opinion that carcinoma originating in a chronic ulcer was rare.

Dr. W. D. Haggard (Tennessee) said that in dealing with ulcers the operation of wide excision with the cautery and subsequent examination was of great value. He believed in the two-stage operation in late cases. He said that in America they were still looking "like the wise men towards the East for inspiration."

Mr. A. H. Burgess (Manchester) considered early diagnosis of penultimate importance. Surgical treatment must, as always, aim at radical extirpation. He instanced ascites, secondary deposits in the liver or the peritoneum (which might be felt in Douglas's pouch by rectal examination) as contra-indications to radical operation. Fixity to the liver or to the pancreas were not necessarily contra-indications. If the middle colic artery was certain to be damaged, owing to extent of growth to be removed, he thought the case should be left alone. He considered palliative gastro-jejunostomy was indicated only if there was obstruction. He then dealt with the operative details and demonstrated a stomach clamp.

Dr. C. L. Starr (Toronto) emphasised the importance of not "watching." If glands were enlarged, cure was impossible. He did not believe in exploratory operations, except in a limited number of cases.

Mr. Garnet Wright considered that clinical evidence was mainly against the probability of the development of carcinoma on top of a chronic ulcer.

Mr. R. P. Rowlands described a case of primary tuberculous ulcer, which he had treated by resection. He did not consider exploration dangerous in early cases, nor did he think that damage to the middle colic artery was a serious matter.

Mr. H. S. Souttar described two "ludicrously" inoperable cases with which he had dealt, doing a gastro-jejunostomy in the one and a resection in the other, and had succeeded in giving both of them several months of comfortable life. He described and eulogised Schumacher's clamp.

Sir Berkeley Moynihan (President of the Section) stated that surgery had out-paced medicine in the treatment of carcinoma of the stomach. There was very little chance of improvement under medical treatment, but there must always be a certain mortality in cases operated upon. He did not consider that the omentum need be removed—in fact, he left it and used it as a cover for the field of operation. Operations of the type Billroth No. 1 were only suitable for ulcer cases. Examination should be made as often and as fully as possible. There were many methods of operation—each useful. Patients must always be made fit for their operation; there was no great hurry and time spent in transfusion of blood, glucose injections, artificial and real sunlight was time well spent indeed. The President considered that the profession should teach the public about carcinoma, and he put forward the suggestion that the Ministry of Health should send out doctors to preach the gospel of health. If it was suspected that a patient was threatened with carcinoma, the experts should be gathered around him at once.

The openers then briefly replied.

THURSDAY, JULY 23RD.

Treatment of Primary Acute Intestinal Obstruction.

A discussion on this subject was opened by Sir William Taylor (Regius Professor of Surgery, Dublin University). He stated that the surgery of the acute abdomen had advanced so satisfactorily during the past 25 years, with the sole exception of acute intestinal obstruction, that one was compelled to ask why the mortality from that condition was to-day no better than it was at the beginning of the century. He attributed this appalling state of affairs to the ignorance and carelessness, both inexcusable and nothing short of criminal, of the general practitioners and physicians, who see these unfortunate patients in the earliest ages of their illness. Instead of realising that purgatives and enemata could do no good, but, on the other hand, might do infinite harm—apart from the delay in surgical

treatment their administration entailed—these practitioners were continually laying themselves open to an action at law for malpractice or, worse still, they ran the risk of being placed in the dock for manslaughter. The speaker estimated the true mortality of acute intestinal obstruction as nearer 60 per cent. than the figure usually given (35–40 per cent.)—an alarming state of affairs. It was a mystery to him, he said, that general practitioners and physicians, all of whom had come to recognise that the only satisfactory treatment for all other acute intra-abdominal conditions was early surgical interference, could not come to the same conclusion with regard to acute intestinal obstruction. Apart from acute intussusception, the speaker recognised three stages of obstruction: (1) Where (within 24 hours of onset) the patient's general condition was good and there was little or no distension; (2) where (within the second, third, or fourth day) the patient's general condition was still good, but there was considerable distension and the vomiting was severe; and (3) where the general condition was bad: pulse feeble, vomiting continuous and stercoraceous, abdomen distended, and the patient profoundly poisoned. Treatment in the first stage consisted in washing out the stomach with sodium bicarbonate solution and free opening of the abdomen under a general anaesthetic. When the obstruction had been dealt with the stomach was again washed out. In the second stage, the obstruction was similarly dealt with and removed, but, in addition to this, a separate incision was made through the left rectus above the umbilicus and a high loop of jejunum was brought out. A tube of 7 or 8 mm. diameter was fastened into this, after the method of Senn's gastrostomy, and by means of which the jejunum was drained and irrigated with sodium bicarbonate solution. Later the patient might be supplied with sodium bicarbonate and glucose by the same means. In the third stage, Sir William Taylor advised local infiltration of the abdominal wall and withdrawal of a loop of jejunum as above. Should the patient survive, the obstruction might be dealt with later. The washing out of the stomach in these cases is of paramount importance. In obstruction of the large bowel, cæcostomy after the manner of Sir Harold Stiles gave the best results so far as tiding the patient over his immediate dangers was concerned. The speaker then dealt with the condition of acute intussusception, and stated that in his practice it was the most common cause of acute intestinal obstruction. In these cases there could be no excuse for failing to make a diagnosis. He himself had had a total of 81 cases with only three deaths. In cases of obstruction of the adynamic type, Mr. Sampson Handley's method left little to be said on the subject, but Sir William Taylor was of opinion that in very severe cases jejunostomy with siphonage and gastric lavage, combined with morphia, might help the patient for a few days. Finally, he said, until physicians and general practitioners realised that there was only one legitimate treatment for acute intestinal obstruction—namely, early operation—we could not hope to improve our results.

Mr. Sampson Handley considered that the high mortality in obstruction cases was, at least in part, due to the fact that these operations were frequently done by medical men whose skill and training did not justify them in undertaking such a serious responsibility. He also blamed the authors of surgical text-books, whose description of the signs and symptoms of acute intestinal obstruction was often lamentably vague and confused. Mr. Handley insisted on the great value of the "two-enema" test—on the failure of the second enema the diagnosis might be considered as settled. He then dealt at length with the operation of precautionary lateral anastomosis and illustrated his points with diagrams. Death in general peritonitis was usually due to obstruction and not to the peritonitis as such, and the speaker believed that the recovery-rate, even in cases after obstruction had supervened, amounted to 75 per cent., if treatment was prompt.

Prof. D. P. D. Wilkie (Edinburgh) considered that the drainage and washing out of upper coils of intestine in late cases was of the utmost importance. He differentiated various forms of acute intestinal obstruction—such as the “closed-loop” obstruction and the “strangulation” type with its severe degree of shock. In cases of carcinoma causing obstruction, drainage of the bowel above without treating the carcinoma in the first instance was indicated. He considered that in old people with obstruction, the operation of bringing the loop outside, leaving it outside, and then excising it later, was a good one. He referred to operations for the drainage of the lymphatic system and emphasised the great importance of giving enormous quantities of fluid to patients with obstruction, as the chloride deficiency was made good by the fluid.

Mr. Ernest Cowell dealt with cases of acute intestinal obstruction occurring in elderly people and due to causes other than carcinoma. He summarised the notes of nine cases that he had met with and insisted on the importance of the early admission of doubtful cases for treatment.

Mr. Rowlands reported the statistics from Guy's Hospital for the years 1920–24. He considered that some deaths were undoubtedly due to errors of technique, and that though in early cases the operations were easy, in late cases they were very difficult. He believed in jejunostomy with drainage and siphonage in the late cases, and was of opinion that in cases of carcinoma a rapid examination of the abdomen should be carried out at the time of the drainage operation.

Mr. Max Page presented the statistics from St. Thomas's Hospital for the years 1920–24. He also showed a set of charts, comparing in a most interesting way the results of operations in 1900 to 1910.

Colonel Primrose (Toronto) spoke briefly of the operation for drainage of the lymphatic system. He considered the administration of sodium chloride intravenously as of great value in severe cases. Where the efficiency of the ileo-cæcal valve was destroyed, the seriousness of the prognosis, he said, was much increased.

Mr. Reginald Vick presented the statistics from St. Bartholomew's Hospital for the years 1920–24. He pointed out that the doctor was so often sent for only in the late stages, and that this was due to the disappearance of all pain, when gangrene had set in. He advocated the system of observation beds to which patients could be admitted before the diagnosis was certain, and described the working of this system at St. Bartholomew's Hospital.

Mr. Grey Turner presented the statistics from Newcastle Infirmary. The mortality for the radical cure of external hernia was $\frac{1}{2}$ per cent.; for the cases with strangulation it was 20 per cent. The moral, he said, was obvious. He had seen little improvement in results in cases where toxæmia was established. Mr. Turner emphasised the fact that, in his opinion, fecal vomiting was not a sign of intestinal obstruction but of impending death. He believed in the enema test and the calomel test, consisting in small doses of calomel at short intervals, the administration of which would either relieve the condition or complete the picture. The education of the public had its dangers, but he thought that the circulation of leaflets giving the considered opinions of experts might well be circulated to the profession.

Mr. Burgess said he did not see how Sir William Taylor could claim that he was called in late to cases of acute intestinal obstruction and yet was able to show a series of 81 cases of intussusception with only three deaths. He considered distension to be a most valuable early sign of intestinal obstruction, and that it was very important to distinguish, as far as possible before operation, between obstruction in the large and the small intestine. Blind cæcostomy was indicated in cases with obstruction due to malignant disease. The speaker also drew attention to the very high mortality in cases due to obstruction by gall-

stones, and asserted that, in some cases, the obstruction was undoubtedly due to the presence of two stones, one of which was missed.

Mr. Souttar presented the statistics of intestinal obstruction for the years 1920–24 for seven hospitals. The total was 3064. He dealt at some length with the various points and demonstrated them by means of graphs. The very great frequency of intussusception as a cause of intestinal obstruction—second only to femoral hernia—was shown, and its incidence was almost entirely in the first year of life. The analysis of the mortality among the 3064 cases was as follows:—

Cause of obstruction.	Per cent.	Cause of obstruction.	Per cent.
Gall-stones	50.0	Intussusception ..	35.0
Carcinoma	43.5	Intussusception with tumour	35.0
Adhesions	31.0	Volvulus	51.0
Internal strangulation	33.0	Inguinal hernia ..	16.0
Intussusception (idiopathic)	22.0	Femoral hernia ..	20.0
		Umbilical hernia ..	35.0

Reply.

The President briefly replied, and stated that his good results in cases of intussusception were undoubtedly due to the fact that he had preached its signs, symptoms, and treatment at all times and in all places. He said that he was prepared to bear any amount of censure for his opening remarks, provided that they secured the result he aimed at—namely, the early operation in all cases of acute intestinal obstruction.

JOINT MEETING OF THE SECTIONS OF SURGERY AND ORTHOPÆDICS.

FRIDAY, JULY 24TH.

TREATMENT OF FRACTURES.

At the joint meeting of these sections a discussion was held upon the treatment of fractures with special reference to its organisation and teaching. The Presidents of the two Sections, Sir Berkeley Moynihan (Surgery) and Prof. E. W. Hey Groves (Orthopædics), occupied the chair in the earlier and later parts of the meeting respectively.

Prof. G. E. Gask (London) held that although the plan of the segregation of fractures in special wards and under a special staff, advocated by Sir Robert Jones, might be of service to an occasional individual patient, it would involve such great difficulties in a teaching hospital that a change from the present organisation was not advisable. He professed himself opposed to the growing tide of specialism which first began when surgery was divorced from medicine by an edict of Pope Alexander III. in 1163. He shared the view of the late Sir Clifford Allbutt that this artificial separation of the two great branches of the healing art was the greatest blow that had befallen the profession and still constituted a weakness. Any further separation was to be deprecated and our efforts should rather be towards fusion. While it was obvious that those who specialised in a small subject could and did attain a higher degree of skill in that branch and had been the authors of many advances, such an argument could not be applied to the education of medical students, whose chief need was a firm grounding of the fundamental principles which were applicable to all types of injury and disease. The present medical curriculum was overloaded with special subjects, such as diseases of the eye; of the ear, nose, and throat; lunacy; fevers, and so forth; and there was a danger that in the desire to teach a smattering of everything the main principles of medicine would be forgotten. His own hospital recognised this danger when, after long discussion, they decided not to establish a separate department of urology. Certain of the younger members of the staff were, however, encouraged to take up and teach this specialty in conjunction with their ordinary work as general surgeons. Thus the student was enabled to start his professional work with the knowledge that there was no mystery about the use of the cystoscope and that with practice he might

attain sufficient skill in handling it to make it a valuable addition to his armament as a general practitioner. Sir Robert Jones's recommendation, if carried into effect, would establish a fresh department and still further subdivide the student's education. It was his belief that any defects in the treatment of fractures at the great centres of medical education would speedily be remedied without recourse to such a step. Medical schools were very sensitive to public opinion, and the fact that it had been thought necessary to hold such a discussion and the publicity given to it would, in itself, be sufficient to stimulate them to make any essential reforms in that branch of their work.

Sir Robert Jones (Liverpool) held that the treatment of fractures was not as good as it should be and that the great teaching hospitals should give a lead to better things. Fractures were regarded as an incubus in most of the general surgical wards; they were of little interest to the majority of general surgeons, whose house surgeons were encouraged to discharge them at the earliest possible moment to make room for patients who needed some form of operative treatment. And the treatment of out-patient fracture cases, which was left almost entirely to the inexperienced resident staff without any supervision by the surgeons themselves, was even worse. One very frequently saw lamentable deformities, which should not have arisen, follow fractures treated at teaching hospitals. He maintained that the treatment of the patient should be the first consideration at all hospitals and that the training of medical students even at the teaching hospitals was a secondary matter, although he did not admit that the segregation of fractures, which he advocated, need involve any insuperable difficulty in medical education. The "segregation scheme" was already in successful operation in many teaching hospitals in America and in several in this country with marked benefit to the patients and no ill-effect upon medical education. The results which might be achieved by his scheme were illustrated by those obtained in the cases of fractured femur during the latter part of the war (when specially trained staffs were available) which were better than any ever attained before. The lesson which should have been learnt then was already being forgotten, and again one saw gross errors in the treatment of common fractures which arose, he thought, from lack of interest on the part of many of those who held the responsibility for treatment. His scheme of segregation of all fractures in one department, not necessarily under an orthopaedic surgeon or indeed under any one surgeon, would lead to comparison of results and a healthy rivalry between those in charge, with resulting benefit to both patient and surgeon. Only those surgeons who took an interest in this work need participate in it, and others would be glad to be relieved of the responsibility and freer to carry on the work in which they were more especially concerned.

Mr. S. W. Daw gave details of the working of a special fracture department under his charge at Leeds. He emphasised the teaching value of a resident orthopaedic officer working under the general or orthopaedic surgeons. This officer did a daily teaching round and gave demonstrations of details of splintage and the many items that needed daily supervision in a manner that the heads of departments had neither the time nor the patience to do.

Dr. R. Osgood (Boston, Mass., U.S.A.) said that a scheme of the type advocated by Sir Robert Jones had been in operation in his hospital for some years. Prior to this some fractures—in particular the not uncommon compression fracture of the spine—were not recognised, and others had resulted in unnecessary crippling of patients. As a result the great industrial concerns had been forced to form their own fracture clinics and this had stimulated the medical profession in America to take a greater interest in fractures. At a conference between surgeons from all parts of the United States a syllabus of standardised treatment of fractures was agreed upon and published. Dr. Osgood gave details of the intensive teaching of

students, at the fracture service, which appeared to be very thorough.

Mr. Henry Wade (Edinburgh) commented upon the general agreement that the treatment of fractures was at present unsatisfactory, and pointed out the heavy financial cost of failures to the employer of labour. One employer had told him that a case of malunited fracture of the femur cost from £500 to £1000. No argument as to the interests of the medical student was admissible when those of the patient were compromised by the present system. But in point of fact segregation gave opportunities for that hour-to-hour teaching by a whole-time officer which was so necessary in this special department.

Mr. H. Platt (Manchester) had had charge of a fracture service for 12 years, during which 40 residents had passed through the department, the majority of whom were now in general practice. These men were able to deal with fractures in their own practices with confidence and ability.

Mr. H. A. T. Fairbank (London) had charge of a fracture service and found that it possessed many advantages from the teaching point of view, since in one hour many types of fracture could be seen and demonstrated, and the apparatus used could be standardised so as to combine simplicity with efficiency. He admitted, however, the difficulty of getting the student to attend a fresh department, and suggested a revision of the curriculum to enable more time to be devoted to this important branch.

Mr. H. H. Sampson (Birmingham) was averse to segregation from the teaching point of view. He pointed out that to be efficient the fracture service would have to be a night-and-day one, since the ultimate result depended largely on the officer (usually the casualty house surgeon) who first saw the case and splinted it. Should a separate department be established the problem of the allocation of the student's time, already overburdened, would be reopened, and, finally, the ordinary house surgeon would lose the benefit of having handled these cases which were so instructive to him in general practice later.

Mr. Max Page (London) did not approve of the creation of a new specialty. For the general practitioner in the country and for the doctors in the services and abroad it was essential that instruction in the treatment of fractures should be a part of the ordinary surgical curriculum, and not regarded as a specialist's department. If segregation were adopted it must fulfil this condition.

Prof. A. W. Sheen (Cardiff) was also averse to making a new specialty. He pointed out that in many emergency conditions, particularly those arising from motor accidents, the fractures played but a small part in the condition, which might call for the excision of wounds, blood transfusion, and other measures directed against shock which would not come within the province of a fracture specialist. He advocated instead the establishment at the teaching hospitals of one or more large surgical teams which should include one member with a special training in fracture work as well as experts in other departments. He agreed, however, on the advisability of establishing a special fracture out-patient department. The student could not be expected to become expert or even familiar with all fractures, but should have his teaching concentrated upon the commoner ones. A "follow-up" of fracture cases showed that many results were much worse than they should be.

Mr. Gwynne Williams (London) remarked that the active treatment of a fracture only ceased when the patient was restored to full activity, whereas, for example, in the average case of appendicitis the treatment was practically concluded at the operation. For this reason he made one student responsible for each fracture case, who should as far as possible see the case through to a conclusion. It was very important that if any change was to be made the ordinary residents should still have opportunities of handling fracture cases.

Mr. McAdam Eccles (London) was against segregation, mainly because of the difficulties it would involve in teaching. To establish a fracture ward would also entail a large increase in beds devoted to this service with a consequent reduction of those available for general surgical work. Already the establishment of separate departments for venereal disease and tuberculosis had resulted in a reduction of the opportunities afforded the student of studying these cases. He maintained that the present system at St. Bartholomew's, while not the ideal one for every fracture case, was the best possible in the long run for the average fracture.

Mr. R. C. Elmslie (London) pointed out that over 100 years ago St. Bartholomew's Hospital had appointed two surgeons specially to deal with fractures, although the office had been allowed to lapse. He complained of the lack of proportion in the allotment of the student's time, and that much of it was wasted in watching operations and writing them up which might more usefully be employed in learning more of the subject under discussion. A fracture ward, the beds of which were open to all the surgeons, would promote rivalry while leading to standardisation of apparatus so that the student might have a clear-cut picture of one treatment for each fracture instead of a confused picture of many. It would be easy to arrange space in the student's curriculum (at least at his own hospital) to carry out the reform.

Prof. A. Fullerton (Belfast) did not consider a separate fracture service necessary at his hospital. Though his beds were limited he never refused a fracture case and devoted much time to them with gratifying results. His house surgeons, who were taught to regard shortening of one inch or a stiff knee after fracture of the femur as a disgrace, shared his enthusiasm. As a result, the average shortening in his last 40 cases of fracture of the shaft of the femur was under one-quarter of an inch. Many fractures must of necessity be treated in small cottage hospitals or even in their own homes by ex-dressers; he therefore felt that it was important that instruction in fractures should be a part of the student's general surgical training and not handed over to a special department.

Mr. W. R. Bristow (London) urged that the example of gynaecology, with its separate staff, residents, nurses, and wards, proved that teaching need not suffer by the establishment of a separate department. He supported the suggestion that the student's time-table should be reorganised, and maintained that the proper teaching of fractures could only be obtained by segregation.

Mr. R. C. Affleck made a plea for greater simplicity. The late Prof. Lucas-Championnière was not ashamed to exhibit to the world the results he was able to attain without any apparatus at all. The speaker maintained that the proper place to treat any fracture was in the nearest bed. He had recently been in an operating theatre where fractures were treated, and a list of the instruments kept there contained over 1000 items.

Dr. A. T. Bazin (Montreal) said that at his hospital there was a fracture department under his charge, but not all fractures came to the department. In over 2000 cases they had no case where amputation had to be performed, although one or two came into the department with a recent amputation. There were three cases of delayed union, no cases of non-union, and no operations for plating were performed; but three plates were removed from cases transferred from elsewhere. It was acknowledged that the results obtained in the fracture clinic were better than those of the general surgical wards in the same hospital. Students received tuition in the clinic and, indeed, the teaching had proved so successful that they were now asked to extend their work in that direction.

Prof. Hey Groves remarked, from the chair, on the virtual unanimity of all the speakers that there was room for improvement in the present treatment of fractures in general surgical wards. War experience

had made us unsatisfied with present results. It should not be thought that the discussion exhibited a gulf between the general and the orthopaedic surgeons; Major M. Sinclair's work in connexion with fractures of the femur was sufficient to show what could be done by the general surgeon in the treatment of fractures when his interest was stimulated.

SECTION OF ORTHOPÆDICS.

THURSDAY, JULY 23RD.

TUBERCULOUS DISEASE OF THE SPINE.

Under the presidency of Prof. E. W. Hey Groves (Bristol), Sir Henry Gauvain, in the unavoidable absence of Dr. J. Calvé (Berck), opened a discussion on this subject. He commented on the great improvement in the treatment of Pott's disease which had taken place during the last 20 years. The severe deformities—so common years ago—were now comparatively rare. Bacteriological investigations conducted by Dr. Stanley Griffith (Cambridge) suggested that the number of cases of Pott's disease due to the bovine bacillus was on the increase, so that the problem was intimately concerned with the campaign for the provision of a pure milk-supply. In the therapeutics of this condition the value of general measures and adjuvant treatment, such as heliotherapy and artificial light, was universally accepted. He believed that the general mortality of Pott's disease had been reduced considerably by the introduction and adoption of the aspiration of abscesses. Calvé's intraspinal tapping of an abscess producing paraplegia was a valuable addition to our treatment methods. With Calvé and others the speaker deprecated the performance of any of the ankylosing operations—e.g., Albee bone-graft or Hibbs's operation—in children. In the adult, however, such operations were founded on sound principles. The mechanical methods used at the Treloar Hospital, Alton, were next described and illustrated by lantern slides.

Mr. G. R. Girdleston (Oxford) believed that the ankylosing operations had a certain rôle in the treatment of children with Pott's disease. It was not unusual to find that the deformity increased in ambulatory patients who had had efficient early treatment. In such cases a spinal fusion was an added safeguard. The technique he adopted was that of Hibbs, with the addition of osteo-periosteal grafts laid on each side of the spinous processes. The problem of Pott's disease in the adult was much more formidable, and especially where sinuses had developed. In his own hospital out of a consecutive series of 30 adult cases, 9 were admitted with sinuses—of the latter, 8 died after varying periods. Mr. Girdleston advocated very free operative drainage in all such infected cases.

Dr. W. T. Pugh (Carshalton) declared himself as an uncompromising opponent of spinal fusion operations in children. He emphasised the potential dangers of hyperextending the spine at the level of the disease during the period of recumbency on a frame. He chose a suitable level of the spine at which to produce a compensatory lordosis, and hyperextended the frame accordingly. It was necessary in the ambulatory stage to use a jacket which controlled the spine and allowed for growth; otherwise late deformity would develop.

Mr. D. McCrae Aitken (London) said he was in favour of complete and uninterrupted immobilisation during the stage of recumbency. He carried out spinal fusion by operation almost as a routine, but with no neglect of adequate splinting. The operation was not suitable for young children and should only be performed after deformity had been corrected. It was especially successful in the cervical and lumbar regions.

Mr. F. C. Pybus (Newcastle) emphasised the necessity for a prolonged period of after-care. The criteria of cure were not easy to define although valuable information was gained from a scrutiny

of successive radiograms. In his hands the treatment of cold abscesses by open evacuation with careful sponging and subsequent closure had given excellent results.

Mr. S. Alwyn Smith (Cardiff) condemned wholeheartedly open operations for cold abscesses. He deprecated the tendency to cut down the period of recumbency.

Mr. R. C. Elmslie (London) referred to his surveys of crippled children in the London County Council schools, which had shown in a most striking manner the value of the provision of country hospitals. He did not consider that it was always advisable to attempt to correct an established kyphus; in any case correction was apparent only and was gained by providing compensatory curves. In his opinion the ankylosing operations had come to stay. He operated on patients over the age of 14 years at a stage when the disease was becoming quiescent. Adequate post-operative treatment was, of course, an essential.

Mr. H. A. T. Fairbank (London) dealt with the difficulties in diagnosis. Developmental anomalies of the spine and new growths might simulate Pott's disease. A number of radiograms illustrating such cases were exhibited. He practised spinal fusion operations in patients over 14 years, and he believed it was better to ankylose a less limited area of the spine than was generally taught. He had met with a few cases where there were two foci of spinal disease at different levels. He agreed with Mr. Girdlestone that very free drainage should be established in all sinus cases.

Mr. T. P. McMurray (Liverpool) considered that patients with sinuses did much better when allowed to walk about wearing a suitable spinal brace. In his opinion the ankylosing operations should be reserved for adults.

Prof. R. B. Osgood (Boston) quoted his impression of Scandinavian clinics, which he had recently visited, and said that one was bound to recognise that with what might be termed partial immobilisation very perfect results were obtained. The findings of the Commission of the American Orthopaedic Association on the value of the spinal fusion operations were quoted—namely, that such operations did not, in themselves, control the advance of the disease or deformity. In his own clinic an operation of the Hibbs's type combined with osteo-periosteal "ribbon" grafts was practised; he did not consider the Hibbs's operation as inherently difficult. In adult patients it was evident that multiple foci of disease at different levels were not infrequently seen. Difficulty in diagnosis arose and, in adults, in the early stages syphilis, malignant disease, and multiple myelomatosis must always be borne in mind.

Mr. S. W. Daw (Leeds) thought it was wise to avoid too great a degree of hyperextension of the spine during the recumbency stage. He had experienced very good results from spinal fusion, but he did not do the operation in children.

Dr. T. Hartley Martin (Leasowe) had employed Calvé's method of intraspinal aspiration in a number of cases, and he did not think the method had any special dangers. It was not difficult if one practised first on the cadaver. It must be recognised that relief from paraplegic symptoms could only follow in cases where the compression was due to the presence of an abscess sufficiently liquid to be tapped.

Sir William de Courcy Wheeler regarded the operation of spinal fusion as a valuable addition to recognised conservative methods. His method was to implant a graft on the rawed surfaces of the laminae.

The discussion closed with the reply of Sir Henry Gauvain.

OSGOOD-SCHLATTER DISEASE.

Mr. R. Ollerenshaw (Manchester), in a short paper illustrated by radiograms, presented an analysis of 32 cases he had dealt with personally. He considered that in childhood two lesions occurred conse-

quent upon sudden traction on the lower quadriceps mechanism, (a) a traction-fracture of the tip of the upper tibial epiphysis (Osgood-Schlatter disease), or (b) a fracture of the lower end of the patella. In three cases where both knees were simultaneously injured one side showed the first type of lesion and the other the second type. Both types were therefore representative of the common fractures of the patella in adults. The treatment advised was complete immobilisation for one month, followed by a period of six weeks, during which the range of knee flexion was restricted.

Prof. Osgood referred to the effects of traction by such a strong tendon on an actively growing epiphysis. He agreed that although the earlier cases he described had all occurred in boys, it had since been found that girls were equally liable. In some cases it was possible to obtain a cure by simple strapping down of the patella.

SECTION OF DISEASES OF CHILDREN.

THURSDAY, JULY 23RD.

Treatment of Empyema.

Dr. Carey F. Coombs, who presided in the absence of Dr. Robert Hutchison, said that the subject of empyema had made considerable progress of recent years, but it was time that we discovered the effect of war surgery on its treatment; whether, for instance, primary suture had been found to answer in civil life. An increased sense of responsibility towards cases of empyema had arisen in the medical profession. It was no longer regarded as something to be dealt with by telling the house physician to make an incision. Its treatment required the coöperation of physician and surgeon.

Dr. Hector C. Cameron, in opening the discussion, confined himself to the medical aspects of empyema. In infants the condition had a very high mortality: 75 per cent. in the first year and 50 per cent. in the second year of life. In the third year the figure dropped to 18 per cent. and thereafter remained at about 6 per cent. The high mortality of the first two years of life was due to the long duration of pneumonia at that age. It was always a favourable feature when the rise of temperature due to the pneumonia was separated from that due to the empyema by an interval of time (metapneumonic empyema). If the empyema developed when the pneumonic condition was still active (synpneumonic empyema) the prognosis was not so good. Empyema in young children was generally synpneumonic owing to the duration of the attack of pneumonia. In the third year of life the short-lived lobar type of pneumonia became the rule, and empyema was of the metapneumonic type with corresponding improvement in the prognosis. Among adults and older children synpneumonic empyema hardly ever occurred except with influenzal pneumonia. The distinction between synpneumonic and metapneumonic empyema was important from the point of view of treatment. Rib resection was apt to be fatal in the former type though followed with most satisfactory results in the latter. The best results in synpneumonic empyema were obtained by aspirating the pus until the lung condition had improved, when an operation might be performed. But successful treatment was not concerned merely with saving life. It was necessary to restore the function of the lung. Expansion of the lung was most often prevented by thickened pleura and the formation of fibrous tissue around the cavity. This result was due to delay in the establishment of satisfactory drainage, insufficient drainage, or to secondary infection, presence of a bronchial or pulmonary fistula, or of a foreign body in the cavity. Early diagnosis and operation at the right moment were of the greatest importance in preventing chronic empyema. Once the lung was bound down by rigid fibrous tissue decortication alone would release it.

Mr. Henry S. Souttar analysed the cases treated in the London Hospital for the last 15 years. Half the cases occurred under the age of 10, and 70 per cent.

of these were between the ages of 1 and 6. The mortality was highest in the first year, 73 per cent., but the number of cases was small. In the second, third, and fourth years the number of cases was larger and the death-rate was from 40 to 60 per cent. The mode of onset was important in prognosis and treatment. When empyema occurred as one feature of a general infection it was often fatal, and any attempt at radical treatment would lead to disaster. When it followed a subsiding pneumonia operation was indicated and the outlook was good. Probably empyema of itself was never fatal. Death was due to accompanying disease of which empyema was only a particular manifestation. The type of infecting organism was important. The mortality in pneumococcal infection was 6 per cent., in streptococcal 24 per cent. In pneumococcal empyema massive adhesions formed, limiting the disease and preventing gross collapse of the lung. Ultimately the adhesions might delay recovery and lead to chronic empyema, but in the acute stage they were of service. In this type the best treatment was to open the cavity freely, evacuate the pus, clear out all solid masses of fibrin, and drain the cavity by a closed method. In young children an intercostal incision would give sufficient access, but in older children rib resection was more satisfactory. The pus must be evacuated slowly.

In the non-adherent form of empyema repeated aspiration was indicated for perhaps five or six days. The form of operation then undertaken would depend on the patient's condition. The post-operative treatment was most important. Sterilisation of the cavity and expansion of the lung were the objects to be achieved. Siphon drainage, and in some cases injection of saline or Dakin's solution, were the best means to this end. Local anaesthesia was contra-indicated in children. Ether or chloroform might be used, but the speaker preferred gas and oxygen as an anaesthetic for this operation.

Dr. F. G. Chandler, from the point of view of treatment, classified empyema into four groups: Ordinary (occurring after or during pneumonia), acute fulminating, chronic, and tuberculous. Rib resection was introduced by Arbuthnot Lane in 1882, and as a result mortality diminished considerably. At the same time our conceptions of disease were advancing and the importance of early diagnosis was being recognised. It was wrong, however, to employ rib resection as a routine in young children. Under the age of 4 it should never be necessary. He had seen cases end disastrously which might have been saved if preliminary aspiration or treatment by simple incision and drainage had been employed instead of resection. In the treatment of empyema four things had to be considered: The evacuation of pus, the expansion of the lung, the speediest convalescence, and the comfort of the patient. Suction drainage had been employed to bring about expansion of the lung, but in the speaker's opinion this was tackling the problem from the wrong aspect. If the lung did not expand it was because there was disease within it or because it was held prisoner by thickened pleura and adhesions. The latter could be dealt with mechanically or by irrigation with Dakin's solution. Fulminating empyema was usually due to a streptococcal infection. The only treatment was repeated gentle aspiration until the patient could support operation. It was important to aspirate slowly, replacing the fluid with air if the patient showed signs of cyanosis or collapse.

Mr. W. H. C. Romanis, while agreeing cordially with those speakers who laid stress on the mortality of empyema in young children, wished to call attention to the serious sequelae of sinus formation, fibrosis of the lung, and bronchiectasis in patients who recovered. Surgically speaking, there were four chief kinds of empyema: those due to the pneumococcus, those due to the streptococcus and other organisms, those which were early, and those which were late. It was of the greatest importance to ascertain the nature of the organism before operation. The masses of fibrin formed in pneumococcal empyema often caused an alteration in the physical signs. In adults it was

essential to remove the fibrin at operation as it would interfere with the healing of the wound and the expansion of the lung. But in children, although removal of solid masses of fibrin was important, everything had to be done to minimise shock, and therefore repeated aspiration should be tried before resorting to operation. There was no urgency about operating in pneumococcal empyema, in contradistinction to the streptococcal variety, in which some method of removing the pus should be proceeded with immediately. Aspiration might be practised at first; but if the patient did not improve in a day or two either operation or the insertion of a large cannula must be resorted to.

Mr. T. Twistington Higgins said he had no panacea to bring forward. Success in dealing with empyema depended on early and accurate diagnosis and efficient operative and post-operative treatment. The operative procedure employed would depend on the age and condition of the child, the character of the pus, and the size of the empyema. In his experience a knowledge of the bacteriology of the pus did not assist much in treatment. He had not found it possible to say that all pneumococcal cases should be opened and all streptococcal cases aspirated. Some indications of the patient's resistance might be obtained from noting the characters of the white cells and the extent of phagocytosis exhibited by them. Dr. Hugh Thursfield was endeavouring in this way to sort out cases which might have the chest wall closed after evacuation of the cavity. The closed system of drainage was best. Continuous aspiration was useful in some cases and could be carried out by the method of Poynton and Reynolds. Breathing exercises were of great benefit in promoting re-expansion of the lung.

Dr. Clarke gave his experience of primary closure in empyema. The type of case suitable for primary closure was the chronic case which gave so much trouble when dealt with by other methods. Out of 21 cases two healed by first intention. In the others the wound broke down, but all did well. Primary suture was worth trying because, even if the wound broke down, the patient was no worse off than if a tube had been inserted in the first place.

Dr. L. A. Parry said that happily there was agreement between the speakers on main points. He thought, however, that a piece of rib should be excised in all cases even in young children, though not more than 1 in. to 1½ in. was necessary. The game of soap-bubbles was excellent as an exercise for re-expansion of the lung.

Mr. R. A. Ramsay considered that the objection to rib resection in young children was that it made the operation longer and more severe. In infants all operative measures should be reduced to the shortest time. The difficulty that the incision was not large enough could be overcome by using two moderate-sized tubes side by side. After 24 hours a large tube could generally be inserted. When pus was evacuated from an empyema the diaphragm rose and the chest wall tended to fall in, thus obliterating the lower part of the cavity. It was therefore necessary to drain not at the lowest but at the highest point of the abscess. As the patient was in bed drainage would be equally efficient.

Dr. Wilkie Scott pointed out the difficulties encountered in dealing with very chronic cases of empyema. He raised the question whether in such cases it was not best to aspirate or to close the cavity by primary suture.

Mr. P. T. Crymble agreed with Mr. Ramsay that the incision should be made in the region of the fourth rib. He found treatment of chronic empyema most unsatisfactory. The cases relapsed constantly. Decortication was a dangerous operation.

Reply.

Dr. Cameron said in reply that the discussion clearly showed that in the details of surgical procedure—the site and the extent of the incision, the character of the drainage, and so forth—there was very great divergence of opinion. It seemed to him that the

prognosis was mainly determined by one consideration only, whether or not intervention was made at the right moment. He thought the same was true in pneumococcal peritonitis. The evacuation of a residual collection of pus gave brilliant results. The high mortality of pneumonia in young children limited the opportunities of securing this result.

Mr. Romanis replied for Mr. Souttar. He said that the details of technique had been thoroughly discussed. Primary closure was not an unreasonable procedure in adults, but it was open to objection in children. Resection of a rib added to the gravity of the operation in young children. A rib-spreader was necessary for exploration, for with it good access could be obtained. He agreed with the speakers who advocated high incision.

In our issue of August 8th, p. 286, in reference to the display at the exhibition at Bath, we alluded to the drugs S.U.P. 36 and S.U.M. 36, prepared by the British Dyestuffs Corporation, Ltd., as arseno-benzene preparations. We are informed by the Fine Chemicals Department of the Company that these products contain no arsenic in the molecule, and we are happy to correct the erroneous impression given by the note.

Reviews and Notices of Books.

MALARIA INOCULATION IN G.P.I.

Die Malariabehandlung der Progressiven Paralyse. By DR. JOSEPH GERSTMANN. With a Foreword by Prof. J. WAGNER-JAUREGG. 1925. Pp. 229. G.M.12.

THE treatment of general paralysis of the insane by means of the inoculation of malaria has recently aroused considerable interest. This empirical method has been used in many countries during the last few years, and this book is a detailed account of its history and technique, and of the results obtained both by its pioneers and those who have followed them. We will not trace here the very interesting story in detail, but will leave that for readers of the book. It is sufficient to say now that, for some reason unknown, a succession of any febrile attacks will apparently counteract the disease; and the malarial excitant is chosen because it is very safe, is easily controlled with quinine, and is not communicable even by the anopheles mosquito. The account of the experiments which have established this last fact forms one of the most interesting side-issues in the book.

The author takes blood from an approved tertian malarial patient who has not had quinine and injects subcutaneously 1 c.cm. into the back, pricking deeply and distributing the injection over the different skin layers. The blood should come direct from the donor without delay. The incubation period is from 4 to 8 days normally and can be shortened by using intravenous instead of subcutaneous injection, but this is not recommended. Attacks of fever then proceed at regular intervals, and after 8 to 12, according to the condition of the patient, they are stopped with quinine, of which the usual dose is 8 gr. of the bisulphate twice a day for three days and then once a day for the next four. The exact dose is varied to suit the individual. The condition of the cardiovascular system is ascertained before injection, but the risk of the treatment is slight. Ten minims of the tr. strophanthus are given at the height of each malarial attack, and digitalis may be used throughout if the heart is weak. Treatment must be interrupted for a sudden drop in strength or for alarming heart or gastric symptoms, but not for anæmia or jaundice unless the anæmia be pernicious in type. If necessary, a small dose of quinine will hold up the fever for a few days, and 10 c.cm. of a 10 per cent. solution of sodium nucleinate given intravenously will restart it.

The indications depend on the age and general condition of the patient and on the form and duration

of the paresis. The pyrexia is not dangerous, but if it be interrupted too soon the paresis is not affected. The author places the age-limit between 9 and 68 years, and his oldest case (of 62) is still enjoying a complete remission. Any patient of average strength and stamina can be treated, and aortitis in syphilitics does not counter-indicate treatment unless there is an aneurysm or evidence of myocardial degeneration. Active tuberculosis of the lungs has not been stimulated in the cases under the author's care, though others have reported to the contrary, while healed tubercle has never been lit up. The patient must be quinine-tolerant and not resistant, but quinine idiosyncrasy is a rare thing. The treatment is not suitable for private practice and should not be used in institutions unless the malarial infection is properly understood. Dr. Wagner-Jauregg once lost three patients out of four through the error of a military hospital in sending him a culture of malaria which was not tertian.

Dr. Gerstmann gives a very full statement of the results obtained both in the university clinic where he works in Vienna and in other institutions. He defines a "full" remission as a return to full working efficiency with a disappearance of all but the slightest psychic symptoms, and a "partial" remission as either good or slight. "Good" is a return to social life and light work, and "slight" is a slackening of acute symptoms with improvement enough to allow the patient to return home. Out of 1000 cases only 400 are quoted who have been kept under observation for two years, and of these 33 per cent. show lasting and complete remissions; 14 to 25 per cent. show good partial remissions, while the proportion of cases in which there has been minor improvement with arrest of the disease amounts to about 30 per cent. The symptomatic improvement was in many cases followed by a return to a negative Wassermann reaction in the cerebro-spinal fluid and a disappearance of cells, though the globulin reaction tended to persist. The simple dementing and maniacal forms of paresis are the most amenable to treatment, next come the periodic, and then the tabo-paretic varieties. The best prospects are afforded, naturally, where the condition is caught at an early stage. The method has been tried, but without success, in non-syphilitic paralyses.

Dr. Wagner-Jauregg and Dr. Gerstmann are still busy with the research which they hope will issue in establishing the malarial treatment as a specific remedy. Their book is extremely comprehensive and well arranged, and contains several good microphotographs of brain tissue. Every angle of the subject is explored and discussed with thoroughness, and although the language is quite intelligible even to a moderate German scholar, it will be a great pity if an English translation is not published at once.

TREATMENT OF INTERSTITIAL KERATITIS.

A Preliminary Report. By R. LINDSAY REA, M.D., F.R.C.S., Ophthalmic Surgeon to West End Hospital for Nervous Diseases; Assistant Surgeon to Western Ophthalmic Hospital. London: H. K. Lewis. 1925. With three plates. Pp. 32. 2s. 6d.

THIS is a paper that was recently read before the Ophthalmological Section of the Royal Society of Medicine and covers much the same ground as an address on the same subject read by the author at the Bath meeting of the British Medical Association this year. Its interest lies first in relation to the diagnosis. The author apparently does not believe that any typical case of interstitial keratitis is non-syphilitic. Recent cases give a positive reaction to the Wassermann test, while those old cases which do not still give evidence of syphilis by a positive luetic curve with Lange's colloid gold test. Such has been Mr. Rea's experience, which is very different from that of some other authors, who attribute from 10 to 30 per cent. of the cases to tuberculosis. The other main point in this essay is the importance attributed to active treatment, and especially to

arsenical injections—preferably of novarsenobillon. Tables are appended contrasting the results of cases treated with those untreated, or treated only by atropin, or in which treatment was deferred till too late. There is a possible fallacy in this comparison in that the class of untreated or badly treated cases would naturally include many "chronics" who spend their lives in going from hospital to hospital without much material benefit. Allowing for this, however, the contrast is sufficiently striking.

This little volume is important in that it constitutes a definite challenge to those who still maintain that in interstitial keratitis the specific treatment for syphilis is of no effect. In Mr. Rea's view it is urgent.

BLOOD TRANSFUSION.

La Transfusion du Sang. Étude Biologique et Clinique. Par P. EMILE WEIL et PAUL ISCH-WALL. Paris: Masson et Cie. 1925. Pp. 247. Fr. 20.

THE recent publication at Paris of a work on blood transfusion by Drs. Pauchet and Bécart has been followed after the lapse of only a few months by the appearance of a second work on the same subject by Drs. Emile Weil and Isch-Wall, which is the subject of the present review. Two books covering so nearly the same ground and published almost at the same time can only be regarded as rivals, and it may be stated at the outset that the book which is second in time of publication is easily first in merit. It is a book of greater authority than its predecessor, having been produced by two writers who have already made numerous contributions to the literature of transfusion, and shows evidence of a more thorough knowledge of the ramifications of the subject.

An interesting account of the history of transfusion is followed by chapters on the "biology" of transfusion in general and of citrated blood in particular. It is apparent from this section that the authors are convinced followers of the school of Lewisohn, and they advocate the use of citrated blood as opposed to the use of so-called "whole blood." They lay emphasis on the fact that citrated blood is to be regarded not as "modified blood," but as "stabilised blood," its general biological characters remaining unaltered. The calcium ions of the blood are inactivated by the addition of sodium citrate but are not destroyed, and are capable of regaining their activity when the citrate has been removed, as happens in the body of the recipient soon after the injection of the blood. Sodium citrate the authors believe also to be non-toxic in the quantities usually administered in the course of a transfusion.

Even at the present time surgeons can be found who regard the group reactions as being of theoretical interest but of no practical importance, this opinion being based on a happy immunity from "accidents" in performing transfusions with untested donors during the late war. It is instructive, therefore, to find in the present work an account of 12 transfusions performed by the authors before the group test had been introduced. Even in this short series of cases they experienced three serious "accidents," and no more conclusive evidence as to the practical importance of the test could be desired. First-hand information concerning these reactions is not usually found in works on transfusion, most writers having used only tested donors.

A section on the technique of transfusion is devoted largely to the description of a simple method of injecting citrated blood with a syringe as used by the authors. The employment of oxygenated blood described by Pauchet and Bécart is justly dismissed as a device which may satisfy the operator's complaisance without conferring any benefit on the patient. The authors claim, however, that the administration of forced oxygen through the patient's lungs during the transfusion is an additional measure of real value. The sections on the indications for transfusion are comprehensive, covering surgery, medicine, and obstetrics. The authors perhaps

exaggerate the value of transfusion in the treatment of ruptured ectopic gestation when they state that some patients may be saved thereby from certain death. General experience goes to show that the hæmorrhage in this condition is seldom or never fatal, and that routine transfusion in treating it is unnecessary. Each chapter is provided with an adequate bibliography and there are a number of figures in the text.

The book may be recommended as an excellent and up-to-date monograph on an important subject. At the present rate of exchange it is very cheap.

THE EXTRA PHARMACOPEIA.

Eighteenth edition. In two volumes. Vol. II. Revised by W. HARRISON MARTINDALE, Ph.Ch., F.C.S.; and W. WYNN WESTCOTT, M.B. Lond., D.P.H. Lond. London: H. K. Lewis and Co., Ltd. 1925. Pp. 728 + xlii. 20s.

THIS volume constitutes an addendum to the first volume of the eighteenth edition, issued in October, 1924, but in many respects its compilation must have proved as strenuous a task as that of the main volume. The second volume provides a review of reviews (coupled with the authors' well-known laboratory notes) on analytical, experimental, and research work, covering with remarkable completeness the ever-multiplying specialities in these fields. The compilers are to be congratulated on their efforts in incorporating in this volume such very recent work as Gye and Barnard's researches on the filterable cancer virus, the use of the halogenised phenolphthalein compounds intravenously and per os as liver function tests and for gall-bladder visualisation, and induced malaria as a treatment for general paralysis. In the domain of chemistry a practically complete organic analysis chart, arranged in groups, is included, and an account is given of the investigations of flour and bread sold in London shops made as recently as May of this year. It is safe to say that there is no text-book at present on the market wherein these features are to be found. The chapter on radium and its congeners has been fully revised and several important alterations made in such factors as atomic weights, radio-active constants, &c., in the light of the 1923 International Table of Radio-active Elements. The (London) Radium Institute Reports up to 1925 are added.

In this volume the compilers have stolen a march on themselves by incorporating a good deal of material which they might have reserved for the next issue of Vol. I.; they are to be congratulated on their generosity, which has resulted in greatly enhancing the value of the present volume. Instances in point may be mentioned regarding treatment with organic antimony compounds, carbon tetrachloride, gentian violet, mercurochrome, and similar items which have lately been brought into prominence.

We trust that this invaluable work—indeed it is one of the few compilations that merit this adjective—will go on from strength to strength.

The death on July 30th of Dr. W. Wynn Westcott, an original joint compiler of the work, was noted in THE LANCET recently.

PHARMACEUTICAL POCKET-BOOK, 1925.

Eleventh edition. London: Pharmaceutical Press, Bloomsbury-square, W.C. Pp. 438. 3s. 6d.

THIS is a direct descendant of the Pharmacy Students' Pocket Note-Book which first appeared in 1906 and was then edited by Mr. John Humphrey. Now, with its new title, and under the guiding care of the Science Committee of the Pharmaceutical Society, it contains much new information of an extraordinarily varied character; in fact, it contains so much that in many directions it supplements usefully the text-books on the subject. In its routine pharmaceutical information it forms a summary for these text-books, which will be useful in revision for the pharmacy student. For the medical student who needs

less of the knowledge of the ways of pharmacy, it forms an ample stand-by.

But apart from the portion which touches on straightforward pharmacy there are many tables and sections useful to many folk. The dictionary of synonyms is extremely full, and will help the reader of ancient and modern books on medicines. The section on homœopathic pharmacy is all the more useful in so far as it is now so rarely found. "How to Make an Herbarium" is unexpected, but is interesting. The sections on sale of poisons and the Dangerous Drugs Acts, which end the book, are again of the greatest interest to the doctor and a perusal of them may save him much trouble.

PEDIATRICS.

By Various Authors. Edited by ISAAC A. ABT, M.D., Professor of Diseases of Children, Northwestern University Medical School, Chicago. London and Philadelphia: W. B. Saunders Company. Vols. IV.-VI. In eight volumes. £18 per set.

THESE three volumes maintain the standard of thoroughness and exhaustive detail found in the previous instalment. Vol. IV. opens with diseases of the pleura and lung, followed by a most valuable section on the physiology of the circulation, congenital heart disease, and the electro-cardiogram in childhood. Acquired heart disease is also fully dealt with. The account of blood diseases by Dr. W. Palmer Lucas is well written and balanced. On the other hand, the sections on infantilism and Mongolian idiocy are left unillustrated, and the latter, a comparatively common condition, is passed over with less than a page in a volume containing 1271. The section on enuresis by Dr. Wilburt C. Davison is admirable. The volume concludes with diseases of the kidneys, bladder, and genital organs.

Vol. V. contains diseases of the face and jaws, with a chapter on orthopædic surgery. The pathology of the bones is ably written by Dr. D. B. Phemister. Tuberculous disease, syphilis, dislocations, congenital and traumatic, of the bones and joints, are well illustrated and complete, and conform in the main to the teaching in this country. The chapter on surgery of infantile paralysis is one of the best. The volume concludes with chapters on tuberculosis and syphilis, malaria, and infection and immunity.

The greater part of Vol. VI. is devoted to the acute infections of childhood and infectious disease in general. Typhoid fever is given in great detail. Under acute rheumatism authors from this country are freely quoted. The treatment of whooping-cough with vaccines and X rays has evidently found more success in America than it has here. Influenza, scarlet fever, measles, and cerebro-spinal fever are dealt with in great detail. The volume concludes with chapters on anaesthesia in childhood, the peculiarities of surgery in childhood, and foetal malformations. The chapter by Dr. Albert H. Byfield on arthritis deformans, which concludes the volume, is a satisfactory contribution.

THE STORY OF A CITY HOSPITAL, 1848-1925.

Published by the Hospital, Victoria Park. 1925.

NOT long ago the City of London Hospital for Diseases of the Chest changed its name by substituting "Heart and Lungs" for "Chest," but no matter what its official title may be, it will still remain to the medical as well as the lay public "Victoria Park Hospital." Its story has been pleasantly told by Lady Butterworth in a small book which the hospital authorities have just published as an appeal for funds, the whole cost of the publication being borne by certain supporters of the charity. The foundation of the charity was brought about on the familiar and simple lines of 70 years ago, when the need for special institutions was beginning to be obvious to broad-minded people. In 1848 "several gentlemen met at the London Tavern"—long famous, but now gone, and like

to be forgotten—in Bishopsgate-street. The object of the meeting was to discuss measures to meet the wants of the poor of the East End suffering from chest disease, especially from consumption. The Brompton Hospital had been founded six years before, in what was then a semi-rural district, and the City-road Hospital was some 14 years older, but neither of these institutions supplied the wants of the East of London. The outcome of the meeting at the London Tavern was a dispensary in Liverpool-street, which was superseded in 1855 by the hospital near Victoria Park. The Society of Friends has ever been noted for its philanthropy, so that it does not surprise us to be told by Lady Butterworth that two-thirds of the members of the original committee of the Victoria Park Hospital were Quakers, as have been some members of its medical staff. Conspicuous among these latter was that kindly autocrat, Dr. Thomas Beville Peacock, for many years, as Lady Butterworth says, "the guiding spirit of the Institution and almost its ruler," whose memory is perpetuated by the Peacock Ward. Dr. Peacock was also physician to St. Thomas's Hospital, where he died suddenly in 1882, while showing some friends round the building on the Embankment.

These facts and a quantity of others concerning the staff are to be found in an appendix, headed "Personal," which contains brief notes on the physicians and surgeons to the institutions—namely, Henry Jeaffreson, Guy Babington, Aston Key, Erichsen, Hilton, Risdon Bennett, Andrew Clark, James Andrew, Henry Gawen Sutton, and Lord Lister. Of the lay supporters the most outstanding name is that of Mr. Henry Edmund Gurney, who was chairman of the original meeting and treasurer for 18 years, until the failure of the great bank of Overend and Gurney brought him and many others to financial ruin. In Appendix V. a most interesting account of the historical associations of Bethnal Green and Victoria Park is given, for which most of the facts of antiquarian interest have been supplied, as we learn from a footnote, by Mr. A. Forbes Sieveking, the well-known antiquarian, whose father was the famous Sir Edward Sieveking. In 1848 the 200 acres of Victoria Park had recently been dedicated to the public before the neighbourhood had been built over, and when, indeed, it was suburban in character. Adjoining the boundary of the park was a triangular piece of ground of four acres, a part of Bonner's Fields, which the committee of the hospital leased from the Crown, and on which the hospital was built. The Bishops of London had long been connected with Bethnal Green, and Bishop Bonner, of heretic-burning notoriety, had his country house here. Tradition has for long asserted that a house in the neighbourhood of the hospital occupied the site of the palace of the "Blind Beggar of Bethnal Green," whose story is supported by tradition and the well-known ballad, but has no better basis. But Bethnal House, of which the position is indicated on the maps reproduced in this booklet, has an interesting history. Built in the reign of Queen Elizabeth as a country residence, Pepys tells us how he went to dinner there with Sir W. Rider, of his "merry walk with the ladies alone after dinner in the garden; the greatest quantity of strawberries I ever saw, and good." The house was afterwards for many years used as a lunatic asylum, and as Bethnal House it was well known, especially to students of the London Hospital, some of whom still living have studied psychiatry there. It was pulled down in 1921 and its site is now occupied by a public library.

This book is very attractive in appearance and illustrated by maps and photographs, and a facsimile of the scroll commemorating the laying of the first stone of the hospital in 1851. As a frontispiece it has a pleasing colour print of the hospital showing the main entrance and the balconies on the south wing. We cordially share the hope expressed by Sir Alexander K. Butterworth in the preface that its sale may be large and that the charity may benefit substantially thereby.

THE LANCET.

LONDON: SATURDAY, AUGUST 22, 1925.

MEDICAL SERVICES OF THE MINISTRY OF PENSIONS.

SUCH a war as that from which we emerged some five years ago has ploughed deep furrows into the social and moral conduct of the whole world. The story of the medical services of the Ministry of Pensions, which, as far as it covers that period, is set out by Dr. ALEXANDER SANDISON in THE LANCET this week, is illustrative of the tremendous energies that sprang into being in the days of trial, as of the ghastly situations that had to be faced; and we find the lessons to be drawn from the chronicle of events and from the results of remedial measures to be of good omen along all lines of national endeavour. For in respect of the care and amelioration of our sick and our wounded the objects of the Government, through its differently named ministries, have been attained in a very considerable manner. Aided no doubt by the passage of time and the forces of nature, the widespread alleviation of misery of our injured and disabled has been followed by sound remedial efforts; and in a country where this can take place over one great field of endeavour it is not too optimistic to suppose that similar lifting of post-war clouds will occur over other sections of national endeavour.

Those in charge of the men of our fighting or auxiliary forces throughout the war are now able to look back upon an immensely improved state of things. At the present time the conditions still requiring treatment on any extensive scale at the hands of the medical boards are tuberculosis, insanity and psychical manifestations, and certain general medical and surgical diseases of a chronic type. The victims of tropical diseases have almost disappeared from the lists, while the cardiac subjects have become much more tractable by classification, functional cases being separated from organic, and organic being themselves arranged in manageable categories. Insulin treatment, discovered since the cessation of hostilities, arrived in time to be used to the advantage of the diabetic subjects, while epileptics have been more accurately diagnosed with a view to appropriate treatment. But here, while the task of classification has been carried through successfully, the appropriate institutional accommodation remains to be found. The Ministry of Pensions has no establishment of its own for the colony treatment of epilepsy, and the existing colonies are full, with suitable applicants remaining outside. Here, and elsewhere, things remain to be done, but the whole statement of what has been accomplished shows good results, brought about by steady and unceasing work along intelligent lines; and brilliant as the assistance of specialists in every direction has been, it is particularly gratifying to the medical profession as a whole to know that the principles and problems of the diagnosis and treatment, in reference to the medical charges laid upon the country by the war, have been defined and solved, and the bases of pensions assessments arrived at, in accordance with the average medical opinion of the country. While whole-time officers were appointed to ensure adherence to needful standards and regulations, the claimants for pensions appeared before

medical men, usually ex-Service men, whose judgments were arrived at on independent grounds.

During the war the primary object of all treatment was the splendid but horrible one of restoring the disabled man with the greatest rapidity to be an efficient unit in the fighting lines. As the war spread, so the boundaries of the contest came to include territories with a vast variety of diseases associated with their geography, which exacted an immense toll from the forces. Then science entered into hideous coöperation with nature and devised intense methods of warfare previously undreamt of, so that in a short space of time the number of men, whose disabilities obviously precluded them from ever again fighting, mounted up until they became a huge population. Their plight had to be met upon the immediate grounds of compassion and gratitude, and always with the reflection that their futures in civil life were to be secured as far as possible from dependency. At the end of the first year in the war it was clear to everybody that medical treatment must be provided in bulk along many special lines for the benefit of those to whom the nation owed the most poignant gratitude, and thus the Medical Services of the Ministry of Pensions developed out of the responsibility of the fighting Services for their suffering personnel. The Medical Boards, established in the first instance to decide on the physical fitness of recruits, were accordingly so coördinated that they could be adapted to deal with the claims of the seriously or permanently unfit men, and from these were developed the boards of the Ministry of Pensions. Dr. SANDISON'S account of the work of these boards is studiously short, but it conveys a vivid general impression of what has been done, and what remains for doing. The figures confirm the tale, showing graphically the steady rise and gradual decline in number of patients, and of institutions designed to meet their circumstances. While many specialised diseases have been appropriately dealt with, a great assortment of miscellaneous disabilities, chronic or recurring, still require special attention. The victims of bronchitis and rheumatism, for example, need greater facilities for institutional treatment at clinics or out-patient departments, and this is especially important because in such conditions the tendency is towards retrogression as time goes on, while it is often particularly important to cut short the development of sequelæ. Much yet remains to be done, but there is no doubt that under the Ministry of Pensions the medical profession as a whole have fought a hard fight strenuously and with fine results.

THE MALARIAL TREATMENT OF GENERAL PARALYSIS.

WE publish in this issue a review of Dr. GERSTMANN'S comprehensive account of the treatment of general paralysis by malarial inoculation. The good effects of fever on psychoses has been known certainly for 2000 years, but it was not until 1887 that Dr. WAGNER-JAUREGG, of the University of Vienna, turned his attention to the possibility of curing paralysis by artificially induced fever. He tried and discarded several methods before he decided on the subcutaneous injection of tertian malaria blood; erysipelas, tuberculin, dead streptococci, and proteids were all exhaustively tested. Dr. GERSTMANN gives a synoptic account of 400 cases (those of whom accurate after-histories had been kept) out of a total of 1000, and claims a very high percentage of complete recoveries—about 30 per

cent.—with a further 14 per cent. of partial recoveries in which the patients regained a fair measure of social capacity.

The British psychiatrist will want to know how far the malaria treatment has been tried in this country and with what outcome. It must be admitted that the results obtained here have been very disappointing. Dr. GERSTMANN says as much himself in his chapter on the results obtained by other authors, and on turning over the recent reports from a number of our larger mental hospitals (some of which are noted in this issue, p. 405), we find that only a dozen or so have tried the treatment on a few patients, with results so meagre as to be almost inconsiderable. Leicester reports that out of 23 patients 5 fully recovered, 3 were considerably improved, 3 died, and 12 were unaffected. At Chartham Downs one case has been discharged and several benefited, but the medical superintendent feels it is too early to express any definite opinion on the treatment. The one case treated at Barnwood is now free from any abnormal manifestations. Possible reasons for these scanty statistics are (1) this new unspecific treatment may be more likely to succeed in the clinic where it was invented and where everything possible is known about it than it is when adopted by strangers; (2) nowhere in Great Britain could anything like 1000 general paralytics come under treatment in the five years covered by Dr. GERSTMANN'S report; (3) British psychiatrists are still rather suspicious of a method so drastic and empirical and perhaps do not give it frequent trial. A correspondent in our columns this week suggests a milder form of irritant—namely, colloidal sulphur—which might certainly be tried, although the opinion of the original investigators is that the malarial parasite has some specific action. The Viennese experts admit having selected the more promising subjects from their great mass of material during the last two years, and would certainly avoid cases that through age, duration of the paresis, or intolerance of fever would be unlikely to profit by treatment. Certainly it is unfair to condemn a method that has only been tried here and there on batches of three or four patients taken at random. But whatever the reasons for our comparative failure, it would be a great pity if we allowed these results to deter us from testing the malarial treatment on a reasonably large scale. Desperate ills demand desperate remedies; there is very little danger in the treatment to patients of ordinary stamina, and so far no other means has been offered of countering one of the most distressing and hopeless illnesses of our age.

THE IRISH FREE STATE AND THE MEDICAL REGISTER.

THE announcement made on August 15th by the President of the Irish Free State, Mr. COSGRAVE, that the Executive Council of his Government had decided "not to seek the continuance of the United Kingdom arrangement, whereby the medical profession of Ireland, with certain representation, was controlled by the British General Medical Council," has been received with profound apprehension among the ranks as well as in the high places of Irish medicine. Three years ago there was in Ireland a body of medical opinion definitely in favour of the ultimate pronouncement of such a decision, while in our columns in 1922 our Dublin correspondent wrote as follows: "It is suitable that the Irish Government should take under its supervision the keeping of the

medical register of Ireland, for it could hardly permit so important a matter to remain in the hands of a body which is departmentally subordinate to the English Privy Council." There is no doubt that our correspondent expressed the attitude of leaders of medicine in Dublin when he wrote, but the probability of a change of opinion was already foreseen. For three and a half years the Government of the Free State has been in communication with the General Medical Council on the matter, leaving the impression of hesitancy throughout, now seeming to regard the functioning of the Council in Ireland as interference, and now viewing it in the light of a useful protection. From the story of the position it will be clear that either view has reason behind it, while the holding of both views simultaneously seems due to that desire "to have it both ways," which is so commonly cherished and so seldom accomplished.

When the autonomous Free State was set up in January, 1922, it was, of course, realised by the medical profession of the State that their whole status might be affected. Those whose eyes were fixed more particularly on the dawn of national existence saw in the opportunity that was thus given to break away from the jurisdiction of the General Medical Council the beginnings of a new and presumably freer era. Others, again, less concerned perhaps with national statesmanship than with the field of medicine within the Empire, foresaw that separation from the British Medical Register, save under the conditions of a Dominion, might imply an economic tragedy for the ancient medical schools of the young Free State. The disaster might be only temporary, but it was difficult to dispute its probability. This latter view has grown to be the predominant, if not universal, one in the medical profession. Further, and apart from purely economic considerations, it is possible that not a few Irish medical men may have felt some damping of their hopes for the future of medicine in the Free State when none of the persons recommended by the Royal Colleges to the President of the Free State Executive as suitable for nomination to the Senate was selected by him for that dignity. At any rate, the change of heart appears to have become manifest soon after this rebuff. It was settled quite early in the history of negotiations between the Provisional Government of Ireland and the British Ministry of Health that the constitutional arrangements then in force as to the Medical Acts would continue unaltered unless and until the Parliament of the Irish Free State saw fit to legislate for practitioners within its own area. And so up to the beginning of 1924 the old way continued unchanged and undisturbed, nor was any voice of complaint uplifted; the understanding being, on the part of the Free State, that should they at any time desire to "cut the painter," they were at full liberty to do so. But following the Irish Free State (Consequential Adaptation of Enactments) Act of 1923, wherein no mention was made of the Medical Act continuing to be in force in the Free State, the General Medical Council indicated that the separation would occur unless the Free State Government explicitly stated that they wished the connexion to be preserved. This brought action from the Free State, and in July, 1924, a Bill was introduced authorising the General Medical Council to continue its jurisdiction for a period of one year. This Bill was passed by the Senate on Feb. 23rd, 1925, from which date it became effective, and the Free State Government was given the opportunity of extending the interim measure for further definite periods.

While professional fears were thus allayed for the moment, the licensing bodies and professional organisations in the State bestirred themselves to find a more stable basis for the future control, educational and disciplinary, of the medical profession in the country. At a conference held in April of this year between the Minister of Local Government and Public Health in the Free State, in whose department the matter lay, and representatives of the medical profession, it was unanimously urged that the existing status should not be disturbed, and that the Government of the Free State should exert itself to ensure that a common register for Great Britain and Ireland should be maintained as hitherto. Our Dublin correspondent says that the Minister agreed with the medical representatives, whom he invited to form a committee with which he might consult as occasion arose. No occasion had arisen before the decision was announced last week to establish a separate Medical Register for the Irish Free State.

Annotations.

"Ne quid nimis."

THE NATURE OF LIGHT.

WHAT life is to the biologist, so is radiation to the physicist, the quickening impulse that sets matter vibrating, not only matter but electricity, electrons, the electrical atoms. These are set vibrating by radiation, and in turn give out radiation and the two processes are linked in some obscure way. The nature of light is, of course, only part of the greater question of the nature of radiation, yet familiarity with the term induces the more frequent reference to it. Newton gave the first connected theory as to the nature of light. His amazing genius coupled experimental inventiveness with a surpassing imagination. The corpuscular theory which he imagined held its own against the undulatory theory for about a century and a half, until the work of another genius, scientist, doctor, and Egyptologist, Thomas Young, overthrew it by showing that two beams of light could, under certain circumstances, interfere with one another, and as it were, cancel each other's effects. There was no room for such a phenomenon in the theory that light consisted of minute corpuscles ejected from a luminous source. The wave theory of light then held the field for about a century, an enhanced prestige devolving upon it as a result of the work of still one more genius, Clerk Maxwell, whose electro-magnetic theory of radiation retained the conception of undulations, but replaced the mechanical basis of such action by one entirely electro-magnetic in nature. It is probably true to say that Maxwell's electro-magnetic theory of light was held to be true by physicists all over the world at the close of last century, just as the permanence of atoms was by chemists. The discoveries of X rays and radio-activity have modified both of these conceptions. On several occasions Sir J. J. Thomson has pointed out the difficulty of explaining certain phenomena on the wave theory of light, and he has now developed a new theory which attempts to reconcile the two opposing theories, the corpuscular and the undulatory.

It was a happy idea of the Fison Memorial Committee to institute a lectureship to commemorate the life and work of Dr. Alfred Henry Fison, who was associated with the work of the physics department of Guy's Hospital since 1906. The Committee invited our foremost British physicist to give the first of these lectures, and the subject was the Structure of Light. This has recently been published as a small brochure by the Cambridge University Press (2s. 6d.), the account of the lecture being preceded by an interesting and sympathetic account of the life and

work of Fison, a man who endeared himself to mankind generally. Sir J. J. Thomson puts the difficulty of the position in a nutshell when he says: "In all forms of the undulatory theory of light the energy is supposed to be diffused throughout the whole of the space through which the light is passing, and not, as in the Newtonian theory, concentrated in small patches; it is this uniform distribution of energy which has proved the most serious difficulty in the way of the undulatory theory." This difficulty is, perhaps, shown more clearly in what is called gaseous ionisation. It is known that X rays eject electrons from bodies upon which they fall, and it is found that when X rays pass through a gas only a very small fraction of the molecules of the gas so lose electrons; it requires a long exposure to an intense beam of X rays to get one electron out of one molecule in a billion. This is not what we should expect to happen if X rays consist of waves whose energy is spread continuously through space. The same sort of thing happens with gamma rays or ultra-violet rays, but it is rather unusual to get this sort of electron emission by means of ordinary light. In his address on the Structure of Light, which will no doubt become one of the classics of scientific literature, Sir J. J. Thomson develops a theory which is, as he says, a combination of the two older theories. Light is to him partly corpuscular and partly undulatory, a sort of mesh-work consisting of active centres on a ground-work of wave-motion. What of these active centres? Herein lies the most imaginative part of the theory, and we read: "The mental picture I draw of the light given out by an atom or molecule is that it consists of lines of electric force distributed in two ways. The distribution in one part which we may call the corpuscular and which corresponds to the quantum is, as I shall explain afterwards, an anchor-ring formed of closed lines of electric force; this ring moves forward at right angles to its plane with the velocity of light, and this movement does not change its size or shape. The anchor-ring can vibrate, the time of vibration being the time light takes to travel round the circumference of the ring; thus the frequency of its vibration is inversely proportional to its circumference. While it is ejected from the atom it is in vigorous vibration and starts a system of ordinary Maxwellian waves." Further details of this mechanism are elaborated in the text and may be left to the reader. Submitted to experimental test the new theory is likely to fare better than its predecessors, for it reconciles Newton with Young, while paying tribute to the imaginative insight of Faraday, Maxwell, Kelvin, and Rayleigh. Like peaks in a mountain range these names stand out supreme among the British physicists who have brought the study of radiation to its present summit.

ADENOIDS AMONG SCHOOL-CHILDREN.

IN reading Dr. H. P. Newsholme's report on the prevalence of adenoids among Croydon school-children, it is well to bear in mind that this disease, which now bulks so largely in the reports of school medical officers as a cause of widespread damage to health, was only discovered 40 years ago. Thus in the eighth edition of Erichsen's "Surgery," published in 1884, we read: "Meyer of Copenhagen has described a condition occasionally met with in strumous children, in which there is a general overgrowth of the closed lymphatic follicles situated about the posterior nares and upper part of the pharynx. It leads to more or less complete obstruction of the posterior nares, and is often accompanied by deafness." The Croydon inquiry was conducted in all the departments of 31 out of the 33 elementary schools, and the survey covered some 18,000 children, about 600 of whom had indications of definite adenoids.

Provision of treatment for these children by the Education Committee has altered the normal prevalence of adenoids, and, but for this, Dr. Newsholme estimates that 5 per cent. of the school-children

would be suffering from symptoms calling for operative interference, whereas under existing circumstances about 2 per cent. require it. This is a strikingly small percentage; Gradenigo found in Turin that adenoids were present in one out of every three children coming to his clinic, and Dan McKenzie estimates that over 30 per cent. of all children in Britain suffer from adenoids and require operation. The work of the throat clinic now makes adenoids most prominent in early school life, whereas, apart from surgical interference, this disease, high at the entrance age, would increase to a maximum at the age-group 9 to 11. At almost every age-period there is a clear excess among boys as compared with girls. Some 7 per cent. of boys and 6 per cent. of girls have, or have had, definite adenoids during school life. There is some evidence also that the disease reaches a given degree of severity somewhat later in school life among girls than among boys. A comparison between schools receiving children from the more prosperous and the poorer districts respectively suggests a greater prevalence among the latter. Thus 4995 scholars at six schools serving prosperous districts furnished 60 cases of severe adenoids, 47 cases of slight adenoids, and 128 cases which had been operated upon; whereas 4534 scholars in seven schools serving the poorer districts furnished 90 cases of severe adenoids, 69 of slighter adenoids, and 163 cases in which an operation had been performed during school life. There are no data available to check whether the smaller proportion of adenoids among the entrants to the "prosperous" schools is due to more ready recourse to operative treatment during the pre-school age. Among the "prosperous" children aged 5 years, numbering 237, there were seven cases of severe adenoids, three of slighter adenoids, and two where operation was performed during school life; whereas among the 245 "poorer" children aged 5 there were four cases of severe adenoids, thirteen of slighter adenoids, and six cases where operation was performed during school life.

An endeavour was made in the case of 156 unselected cases of well-marked adenoids to ascertain the date of onset. Where a definite history was obtainable from the parents, it was found that half of the cases who were mouth-breathers, one-third of those who were deaf, and one-quarter of those with enlarged tonsils had developed these defects before admission to school. The available data yielded no evidence of any relation between adenoids and bottle-feeding or prolonged breast-feeding, nor did they support the theory that the use of a comforter favoured the development of adenoids. No connexion could be traced between the sanitary condition of the home and the prevalence of adenoids, apart from the fact that the increased aggregation of persons per room appeared to have an influence. It was clear that adenoids cause a school child to lag behind his fellows in educational level, the effect becoming particularly serious in the upper standards of the school.

We hope that this portion of Dr. Newsholme's report will be widely circulated and lead to similar inquiries in other populous districts. One thing is abundantly clear, that we must not be content with moving the maximum incidence from the age of 10 to the age of 5, but that serious efforts will have to be made to tackle the toddler through the child welfare clinics so as to cut off the supply of damaged school entrants. Probably a considerable number of children, both of the poorer and more prosperous classes, have had their adenoids removed before entering school; but it is certain that many children still suffer because the operation has been delayed too long, and that a large proportion of cases of deafness and chronic otorrhoea, as well as of acute aural suppuration and mastoiditis, could be prevented by more timely removal of adenoids. Although some children first develop symptoms of adenoid hypertrophy later in life, the most suitable age for their removal is usually about 4 or 5 years, and in a considerable number of children the naso-pharyngeal

tonsil is sufficiently enlarged to cause serious symptoms at a far earlier age than this. A test of the efficiency of the service would be the average age of the patients operated on; it would be interesting to have statistics on this point from some of our public clinics. Croydon should be in an ideal position to do this, as owing to the wise co-operation of the Health and Education Committees the child is supervised, as from September, 1924, by the same medical and health nurse staff from infancy to school-leaving age.

THE THERAPEUTIC USES OF SILICA.

In this country silicic acid and the silicates are generally considered unsuitable for administration per os, although the sodium salt is used in powdered form in France. In a recent article in the *Wiener Klinische Wochenschrift* (No. 27, 1925) Prof. Friedrich Luithlen points out that silica is the foundation of the elasticity of living tissues and that healthy activity depends on the maintenance of a proper balance between the calcium and silica constituents of the body. In youth the silica content is at its highest, decreasing with maturity until in age there is a deficiency, with a corresponding preponderance of chalk. Hence the altered biological processes, the diminished pliability of the tissues, and the liability to fractures. Arguing from these facts, Prof. Luithlen has tried the use of silica in certain senile and other conditions attributable to silica deficiency. The best results have been obtained in cases of pruritus senilis where there is no definite metabolic cause for the irritation and the superficial layers of the epidermis are dry and brittle. In many instances where colloid treatment, hypotonic solutions, and organotherapy had been tried in vain, intravenous injections of silicic acid rendered the skin soft and supple and restored the circulation. Good results have also been obtained in all kinds of senile skin disorders such as psoriasis, furunculosis, and acute weeping eczema in the aged, as well as the further advantage of increased immunity and better conditions of life resulting from the restoration of chemical balance in the tissues. The method has also been applied with satisfactory results to cases of arterio-sclerosis, stenosis of the cardiac valves, and tuberculosis of the lungs. The drug may be administered hypodermically or per os in youthful cases where the power to re-absorb silica has not been lost. For this purpose a "silicic acid tea" or the organic preparations can be used. For older people it is best given intravenously, in the form of a 1 per cent. watery solution of sodium silicatum purissimum. The phials should be well shaken, as sedimentation is likely to take place, and 1 c.cm. may be given on alternate days up to 15 or 20 doses. If the claims of Prof. Luithlen are substantiated by further observations we shall have in silicic acid a most valuable therapeutic weapon against a series of trying and obstinate conditions.

CAVERNOUS OPTIC ATROPHY.

A THEORY of chronic glaucoma which is associated with the name of Schnabel holds that it is caused not by pressure on the optic nerve, but by primary atrophy of that structure. The theory was long ago discredited, but has lately been revived in a somewhat different form. Mr. Ransom Pickard¹ holds that "cavernous atrophy" is a distinct entity, that it has no necessary relation to glaucoma, but that in some cases the two conditions may be associated. According to this writer, "cavernous atrophy" is characterised by a cupping of the disc which may or may not extend to the margin all round, an absence of tension, which remains within normal limits, and retinal vessels of normal size. The persistence of a normal tension at once separates these cases from those of glaucoma. The fields for colour are characteristic. In ordinary glaucoma they are diminished in the same proportion as the field for white. In

¹ British Journal of Ophthalmology, August, 1925.

cavernous atrophy the colour fields, and especially the field for red, are diminished far more in proportion than the field for white. It follows that in cases suspected to be chronic glaucoma without any demonstrable rise of intra-ocular tension, the colour fields as well as the fields for white should always be carefully taken. From the point of view of prognosis the distinction between the two diseases is, according to the writer of the paper, most important. Several of his cases of "cavernous atrophy" were kept under observation for considerable periods—one case for 14 years—during which time very little progress in the disease took place, and it is his opinion that the case is typical. The subject is controversial and the number of cases from which Mr. Pickard's conclusions are reached is not large, but seeing that cases of cupped discs resembling glaucoma but with normal tension are by no means unknown, it should not be long before further evidence bearing on the subject is forthcoming.

THE PINEAL GLAND AS A LOCALISER.

RADIOLOGY may have found a use for the pineal gland. The fact that in about 50 per cent. of all skulls the pineal gland is calcified, and can be demonstrated by skiagraphy, has been utilised by Dr. H. C. Naffziger,¹ of San Francisco, for determining on which side of the brain a tumour is situated. In cerebral tumour the portion of brain affected increases in size and pushes to the opposite side the falx and all mid-line structures, including the pineal gland. This displacement of the gland is termed by Naffziger "the pineal shift." The amount of the displacement varies from 1 to 3 cm. A special X ray technique is described. The "pineal shift" occurs whether the tumour be frontal, parietal, or occipital. Lesions of the base, or of the posterior fossa (subtentorial) cause internal hydrocephalus, and both lateral ventricles being equally distended, no "pineal shift" occurs. The two essentials for this method of diagnosis are a calcified pineal gland and an increase in intracranial pressure. Displacement of the gland to the right of the mid-sagittal plane indicates a left-sided lesion and vice versa. In the presence of intracranial pressure a mid-line position of the gland indicates equal pressure on the two sides. In the chronic form of intracranial pressure, due to tumour or abscess, the medial position of the gland means internal hydrocephalus, which occurs in lesions of the posterior fossa and in distortion of the third and fourth ventricles. In 15 cases the X ray findings have been confirmed either by operation or autopsy.

SAMARITAN FUNDS AND SOCIAL SERVICE DEPARTMENTS.

REPORTS of the Samaritan funds and social service departments continue each year to provide valuable sociological material of which we do not yet take full advantage. In the report of St. Thomas's Hospital the almoner points out that coöperation between the medical, nursing, and sociological units of the hospital is steadily bearing fruit, and that this coöperation is in turn reacting on the patient. To quote from the report "a new spirit seems to be growing, a desire on the patient's part to be a shareholder, a partner in the fortunes of the hospital; those who contribute a weekly sum from their wages for its upkeep show a more unselfish interest and pride in the good of the whole institution than formerly." The report affords an indication of some of the changes which are taking place year by year in sociological conditions of the hospital patient. For example, a new problem is being raised at the moment in the after-care of the extremely baffling and almost hopeless cases of encephalitis lethargica, and the special departments are receiving patients who, before the war, would not have sought help from hospitals. The rheumatism clinic affords another instance of the value of sociological inquiry and after-care, and it is not too much

to believe that this work may be partly responsible for the reduction in the number of cases of chorea which now require treatment in hospital. The ever-open door of the casualty department still continues to admit some of the most difficult cases for inquiry, and there is an illuminating passage in the report giving details of the variety of questions which may be presented by one day's casualty work. The almoner comments also on the tasks of daily occurrence which arise in connexion with the patients of no fixed abode who live by casual labour, and states that the number of these patients is tending to increase, a fact which is not surprising in view of the increasing amount of unemployment.

The report of Moorfields Eye Hospital discusses the value of the social service department as a clearing house and a means of putting patients in touch with the various organisations which deal with the blind. Throughout England the Blind Association has visitors who are in communication with their central office, and the social service department of the hospital is thus enabled to coöperate effectively. Patients are frequently ignorant of the provision which has been made for them in various ways by the public authorities, and not the least of the almoner's duties is to help the patient to understand and apply to himself those particular laws and regulations relating to social welfare which have been made for his assistance and not from a desire to interfere with his liberty.

In the report of the Victoria Park Hospital almoner's department emphasis is laid on the housing question. There is little doubt that this outstanding problem remains the chief difficulty in all tuberculosis work. "Patient after patient tells the same tale of ill-health due to being forced to live in over-crowded insanitary houses, and often out-patient treatment in such conditions seems time thrown away." The almoner can only hope to assist certain individuals by repeatedly calling the attention of the appropriate authorities to particularly bad instances. Moreover, the housing problem has a bearing on after-care, which is an important feature of the work in an institution where the question of the return of a tuberculous patient to his own environment is an ever-present difficulty.

The report of Westminster Hospital emphasises similar difficulties. Bad housing again presents one of the greatest hindrances to effective effort; it is almost incredible that in twentieth century England there should be cases of five persons living in one room. The "down and outs," especially among the male patients, also continue to give anxiety. In the case of the older men this may be an unsolvable problem, but in the younger—frequently boys who have wandered to London from the farthest corners of England—some solution should be forthcoming, for it seems impossible to ask the hospital to shoulder the whole burden just because these lads happen to have fallen sick.

The almoner of the Brompton Hospital points out that the coöperation of the social service department of a chest hospital with the medical staff falls largely into two categories—preventive and alleviative; the latter operating indirectly in enabling the patient to obtain and benefit by such means of treatment as are indicated by the physician or surgeon. How wide a field these categories cover may to some extent be imagined when it is realised that patients are taken from all over the British Isles and often from outside them, and that the "coöperation" needed through the social worker may consist of anything from a grant of a daily pint of milk for a few weeks to the removal of a whole family with their Lares et Penates from an East End slum to a Sussex hamlet where house and work have first been found; or again from providing instruction in embroidery to a boy with congenital heart disease, to turning an indolent wife into the family breadwinner. At this hospital the whole ground is covered by the social service department, which deals separately with in-patients, out-patients, and those at the hospital's sanatorium at Frimley. With the latter,

¹ Surgery, Gynecology, and Obstetrics, April, 1925, p. 481.

every effort is made to keep in touch for an unlimited time, the after-histories thus obtained providing not only opportunities to lend a helping hand, but also a mass of information which has proved extremely useful in various investigations into the results and value of sanatorium treatment. The patients, with few exceptions, respond gladly to requests for yearly reports. All the sanatorium patients are interviewed on their admission by the almoner, who also visits Frimley once a fortnight and makes it her business to smooth away the home and financial difficulties which would otherwise necessitate self discharges before the maximum benefit had been obtained from treatment. A special effort is made to minimise the strain of readjustment to economic and social conditions on discharge. Other inquiries into after-histories are undertaken at the request of members of the visiting medical staff, in which work there would seem to be great latent possibilities. On the preventive side a point is made of arranging prolonged convalescent treatment for debilitated children, especially where there is a family history of tuberculosis or when the children are contacts of definite cases. The hospital possesses, through the generosity of friends, two open-air huts at a convalescent home at Hayling Island, and it is hoped to add to their number in the future. Arrested cases of pulmonary tuberculosis are often boarded out to prevent breakdown.

Even a brief perusal of some of the reports of hospital almoners' departments brings out therefore the outstanding fact that inquiry and after-care are enabling the medical staff to get the treatment recommended carried out.

THE birth-rate of England and Wales for the second quarter of the present year is only 19.4 per 1000, equalling the lowest record of any second quarter of any year excepting during part of the war period. The death-rate for the same quarter is only 11.7, the London death-rate being still lower, and standing at 10.1.

SIR JOHN MACALISTER MEMORIAL FUND.

THE second list of subscribers to the Fund opened by the Council of the Royal Society of Medicine to commemorate the 38 years of service of Sir John MacAlister as Secretary is as follows:—

Dr. W. Seaman Bainbridge, Dr. A. J. Ballantyne, Mr. A. S. Blundell Bankart, Dr. H. W. Barber, Surg.-Comdr. K. Digby Bell, Dr. H. Beckett-Overy, Dr. Arthur F. Blagg, Dr. Thos. William Blake, Dr. P. Brooke Bland, Dr. C. Hubert Bond, Dr. Helen Boyle, Mr. Henry Briggs.

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Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXVI.—TREATMENT OF FLATULENCE.

II.*—INTESTINAL FLATULENCE.

INTESTINAL flatulence gives rise to a sensation of fullness or colicky pain in the abdomen which is due to the presence of gas under tension and is relieved by its expulsion. At times the frequent passage of flatus itself may cause considerable inconvenience. Though the discomfort is felt mainly in the lower abdomen, gas occasionally accumulates at the splenic flexure in such quantity that it may be mistaken for gastric flatulence and an attempt made to relieve it by eructation. If the flatulence be gastric in origin, relief will follow, but if intestinal, there will be increasing discomfort from aerophagy. The differential diagnosis may be readily confirmed by X ray examination.

The intestinal gases arise from two main sources: air swallowed with the food and saliva, and gas evolved from the bacterial decomposition of carbohydrates and proteins. Whilst, under normal conditions, either a small quantity of gas only is formed or a large quantity absorbed so that the amount passing out with the feces is small, flatulence may occur under the following conditions: 1. Increased formation of gas by (a) excessive aerophagy, (b) decomposition of carbohydrates and proteins. 2. Deficient absorption of gas. 3. As a result of obstruction. 4. As a result of increased peristalsis.

Increased Production of Gas.

(a) Excessive aerophagy may result in intestinal flatulence and the passage of large quantities of odourless flatus.

(b) Although a rare occurrence in the stomach, the fermentation of carbohydrates and to a much smaller extent the putrefaction of proteins are common causes of intestinal flatulence. These conditions, though favoured to some extent by constipation, are more usually associated with diarrhoea, and have their origins in a variety of causes of which the following are the most important: (1) Dietetic excesses. The ingestion of large quantities of carbohydrate or protein will tend to produce fermentation and putrefaction from the residue which escapes digestion and absorption. The flatulence which results from the high cellulose dietary often given in habitual constipation is an example of this. (2) Deficiency in digestive ferments in the upper alimentary tract. The absence of hydrochloric acid in the various forms of achylia gastrica, and diseases of the pancreas leading to deficiency of its external secretion, will promote conditions favourable to intestinal decomposition. (3) Intestinal infections, whether as a result of infection from the food, from oral or naso-pharyngeal sepsis, or more rarely from chronic appendicitis, may lead to a condition of catarrhal enterocolitis, and by producing intestinal hurry will tend to prevent normal digestion and absorption and lead to fermentation and putrefaction.

Treatment.—The successful treatment of intestinal decomposition depends on the removal of the primary cause and the recognition of the associated disturbance of intestinal function. The stools are often characteristic; in fermentative cases they tend to be acid in reaction, frothy, somewhat sour-smelling, and microscopically show undigested starch granules, whereas in protein putrefaction they are alkaline, have a putrid odour, and microscopically show undigested meat fibre and an excess of Gram-positive organisms.

* An article on Gastric Flatulence appeared in this series last week.

A full consideration of the treatment of these types of diarrhoea is outside the scope of this article, which is concerned with one symptom only—namely, flatulence. This may or may not be of importance, but its efficient control will depend on (a) regulation of the diet, and (b) use of drugs.

(a) *Regulation of the Diet.*—As a means of controlling fermentation and putrefaction much greater reliance can be placed on suitable dietetic modifications than on the exhibition of the so-called intestinal antiseptics which are at best very uncertain in their results.

In carbohydrate fermentation the chief source of the flatulence is marsh gas derived from the break-down of cellulose. Green vegetables and uncooked fruits must, therefore, be strictly forbidden, and in some cases the total exclusion of carbohydrates from the dietary may be necessary. Generally, however, sugar, malted foods, milk, purée of potato and celery may be allowed in moderation. Cammidge¹ gives the following diet table for intestinal flatulence:—

The patient may have: White meat, lean red meat, sweetbread, tripe, calves' head, chicken, pheasant, partridge, tongue, lightly boiled or poached eggs, fresh butter, a little sweet cream, toast or old bread, crusts, wholemeal bread, light farinaceous food with fruit juices, spinach, celery, asparagus, a little potato, unsweetened stewed apples or plums, raw apples not too sour, almonds, Brazil nuts, cocoa essence, meat extracts. One ounce of whisky in four ounces of hot water with two meals.

The patient must avoid: Green vegetables (especially cabbage, radishes, peas, beans, lentils, salads), pears, raw plums, mayonnaise, oily or greasy foods, milk, cheese, excess of sweets, pastry, fresh bread, pork, veal, venison, sausages, hare, goose, duck, pigeon, curries, re-cooked meats, smoked fish, eels, salmon, herrings, mackerel, tea, coffee, wine, malt liquors, soup, broth.

In very intractable cases a diet of cooked minced meat and water, the well-known Salisbury cure, may be tried, but it is very irksome and should be limited to a period of six weeks.

In protein putrefaction a strict lacto-vegetarian diet is more suitable at first. Chicken, game, and fish may be added later, but mutton, beef, and veal should be withheld for some time after the diarrhoea has ceased. Sour milk is worth a trial in these cases with the object of replacing an abnormal intestinal flora with one inimical to putrefaction. The milk should be sterilised by boiling and then allowed to cool to a temperature of 120° F. A fresh culture of the *Bacillus bulgaricus* (tablets are too uncertain in their action to be reliable) is then added to the milk in a thermos flask and the whole incubated for 18 hours. It is then ready for use and may be taken in quantities starting with half a pint a day and gradually increasing until one and a half pints a day are taken. Better results are claimed by certain American writers, Rettger and Cheplin² and Kopeloff³ by the use of the *Bacillus acidophilus* as the souring agent. They use at least 1000 c.cm. of the freshly inoculated milk and combine it with the administration of lactose, which promotes the growth of the bacilli. The method does not appear to have received an extended trial in this country and there are technical difficulties in the way of its general adoption.

(b) *Use of Drugs.*—Drugs are administered with three objects, to aid digestion, to control bacterial decomposition, and to relieve flatulence. In cases associated with achylia hydrochloric acid should be given in the full doses recommended by Hurst, not less than 1 drachm of the dilute acid in a tumbler of water flavoured with orange being sipped during and for a short time after each meal. In pancreatic deficiency various preparations such as pankreon, holadin, and taka-diastase may be tried after meals, but are not very satisfactory. Intestinal antiseptics for the control of putrefaction and fermentation are legion, but the evidence of their value is somewhat unconvincing as a satisfactory clinical assay is well-nigh impossible. The best appear to be calomel,

especially in divided doses, benzo-naphthol (10 to 15 gr. t.i.d. in tabloid or in cachet), and dimol (2 to 4 gr. t.i.d. after meals). Colloidal kaolin is an efficient absorbent of bacterial toxins and may be given in half-ounce doses in water t.i.d. For the immediate relief of flatulence the essential oils are distinctly valuable, the best perhaps being oil of cajuput (minims 2 on a lump of sugar) and oil of turpentine (minims 15 in capsules or cachets). A tablespoonful of charcoal taken once or twice daily is also useful and helps to render the flatus odourless.

Deficient Absorption of Gas.

As in the case of gastric flatulence, this occurs but rarely, and then as a result of chronic venous congestion in heart failure and hepatic cirrhosis. The main lines of treatment have been sufficiently indicated in the previous article in THE LANCET. Inflammatory conditions of the colon may also interfere with the normal absorption of gases and account, in part at least, for the flatulence complained of in these cases.

As a Result of Obstruction.

Flatulence may occur as a result of organic obstruction or in cases of constipation when the intestine contracts on a faecal mass and thus imprisons flatus. Treatment is directed to the relief of the obstruction.

As a Result of Increase of Peristalsis.

Apart from the causes already discussed, great inconvenience and distress may be caused by the frequent passage of flatus from causes purely emotional. The condition is analogous to nervous diarrhoea and is liable to be a very distressing symptom in moments of great mental strain. Diet is ineffectual in cases of this type unless, as sometimes happens, there is an associated intestinal catarrh, and treatment should be directed towards lessening the excitability of the gastro-colic reflex by a full dose of bromides combined with belladonna given at a suitable interval before the symptom is liable to occur.

Acute Flatulence or Meteorism.

Acute gaseous distension of the intestines occurs in certain severe abdominal conditions such as intestinal obstruction, acute general peritonitis, and acute pancreatitis. It is met with also as an important complication in certain infective fevers, notably enterica and pneumonia.

Treatment.—Acute abdominal conditions require surgical treatment, but in the absence of intestinal obstruction, or following its relief, the general principles of the treatment of meteorism are applicable to all cases. All food should be withheld with the exception of small quantities of whey and albumin water. Local applications to the abdomen such as turpentine stipes or hot fomentations are valuable, particularly for the relief of pain. Enemata of turpentine ($\frac{1}{2}$ to 2 drachms to a pint of soapy water) should be given and oil of turpentine, 15 minims in capsules taken by mouth every three hours, is useful. In severe cases the hypodermic injection of pituitrin 1 c.cm., or eserine 1/50th gr., may be tried in the absence of obstruction. The danger of perforation in typhoid should be remembered and these powerful drugs used with great caution, and only as an extreme measure.

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GOVERNMENT LUNCHEON TO STATISTICIANS.—The medical statisticians visiting this country under the auspices of the League of Nations were entertained to luncheon by His Majesty's Government on August 13th. Sir Kingsley Wood presided and extended a very hearty welcome to the visitors. Among the prominent medical men invited to meet the statisticians were Sir Humphry Rolleston, Sir Arthur Newsholme, Dr. H. Robinson, Lieut.-Colonel W. Butler, Dr. Percy Stocks, Dr. J. Brownlee, Dr. Norman White, Dr. J. C. McVail, and Dr. J. Fenton.

¹ Cammidge, P. J.: *Faeces of Adults and Children*, 1914.

² Rettger, L. F., and Cheplin, H. A.: *Arch. Int. Med.*, xxix., 1922, 357.

³ Kopeloff, N.: *Arch. Int. Med.*, xxxiii., 1924, 47.

Special Articles.

THE MEDICAL SERVICES OF THE MINISTRY OF PENSIONS.

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THE PRIMARY OBJECT.

THE primary object of army medical treatment was the speedy restoration of the disabled man to be an efficient unit in the fighting or auxiliary services. As the war widened in scope and intensity the number of seriously and permanently disabled men became so large that attention had soon to be directed to the problem of their future in civil life. Thus, early in the war, there was need to consider the provision of medical treatment to those who were never likely to return to the forces but for whom the nation began to realise a peculiar responsibility. The restoration of their capacity for civil employment, or failing that the provision of the medical care necessitated by their permanently disabled condition, became a function of the State. Thereafter the medical services of the Ministry of Pensions developed out of the existing but limited responsibilities of the fighting services for the discharged disabled man.

Attributability, Aggravation, and Entitlement.

To medical science the war was as revolutionary an experience as it was to the science of warfare. Fresh problems of diagnosis, treatment, and administration arose on a scale previously unknown. Surgeons had to deal with appalling complexities in septic wounds, physicians were faced with an influx of tropical diseases, and with the novel sequelæ of "gas" and "shell-shock," administrators had to evolve hospital accommodation on a gigantic scale. Latterly there was imposed a new responsibility, novel in principle to normal medical practice, that of determining to what extent the total disabilities of the disabled soldier were due to the stress and shocks of war, and how far, therefore, the State could admit responsibility for them. The word "entitlement" took on a new and technical meaning and with it were joined "attributability" and "aggravation," a trinity of mighty import. "Entitlement" was the foundation-stone on which the structure of the Ministry must rest. Its implications, as defined in the Royal Warrants, depended upon the existence of medical unfitness consequent upon service with the forces. The fundamental decision in entitlement is, therefore, a matter of medical judgment—namely, the confirmation or otherwise of an alleged physical impairment.

ESTABLISHMENT OF MEDICAL BOARDS.

The medical boards established to decide on the physical fitness of individuals for military service were eventually, as part of the Ministry of National Service, so coördinated that they could readily be adapted to deal with the claims of unfit men. From them developed the boards of the Ministry of Pensions with the accessory service of the assessors.

In the Ministry of National Service boards the members of the board were general medical practitioners (assisted as required by specialists) working on a sessional part-time basis, so that the judgments of the boards were unfettered and not open to an accusation of bureaucracy. This principle was maintained in the boards of the Ministry of Pensions. The claimant for pension thus appeared before doctors, usually ex-Service men themselves, whose medical judgment was subservient to no over-riding authority, medical or lay. To function with equity and uniformity, however, the boards required guidance.

Whole-time medical officers were, therefore, appointed to coördinate and advise the boards and to ensure an adherence to the technical regulations inseparable from the administration of a large organisation deriving its authority from specific warrants and Acts.

Average Medical Opinion of Country as Basis of Assessment.

Arising directly from a decision that a particular disability was consequent upon war service came the question of the degree of disablement caused thereby. Questions of this kind were new to the majority of the profession. Such assessment, moreover, is by no means easy and affords opportunity for considerable legitimate divergence of opinion. The experience of former wars gave only limited assistance and it was necessary to consider the whole problem largely de novo. Appropriate guidance was therefore given as to the principles on which assessment must be based, with indications of what might be considered an equitable range of assessment for the main types of disabilities and their complications. Except for the assessments fixed by the schedule of the Royal Warrant, these suggestions were based on a standardisation of the assessments which were being made throughout the country by the boards themselves. Thus the main basis of assessment was the average of the general medical opinion of the country. To secure uniformity and equity a special branch of whole-time medical officers, the assessors, was formed to oversee the assessments and discuss with individual boards any instances where their assessments and verdicts on entitlement were out of harmony with that which experience had shown to be appropriate, the final decision, however, resting with the board.

The final development of the boarding and assessing medical services thus resulted in a harmonious combination of the medical experience of the independent general practitioner, the specialist, and the administrator. On the one hand the pensioner was assured of the primary consideration of his case by independent medical men, and on the other of general uniformity and equity of treatment.

Ministry of Pensions Disability Committee.

The Minister, in 1919, appointed the Ministry of Pensions, Disability Committee. This Committee had as its members the Presidents of the Royal Colleges of Physicians and Surgeons, the secretary of the Medical Research Council, and other eminent medical men, who, with the Director-General of Medical Services as chairman and in conjunction with senior officials of the Ministry, medical and lay, considered in detail the medical aspect of the existing principles and regulations. The Committee, with its specialist subcommittees, held frequent meetings throughout 1920, 1921, and 1922. As the outcome of its labours the practice of the Ministry in entitlement and assessment became based upon the highest medical authority. The Committee remains in being and is available when required for consultation on medical problems.

The boards, initiated to deal with applicants for pensions, are now chiefly concerned with renewals and reassessments, although there still occur a considerable number of fresh applications—e.g., for the year ending March 31st, 1924, Article 9 claims averaged 600 a week, and for the year ending March 31st, 1925, there were 23,846 Article 9 boards, of which 730 were for officers. Their work in renewal and reassessment has been further added to by the institution of special boards for final awards. Further, it was inevitable that appeals should be made for reconsideration of the findings of the boards, and in October, 1919, appeal boards were constituted. Their constitution and procedure were on similar lines to the primary boards. It is remarkable that since their commencement the number of claims to these appeal boards has maintained a steady average of but 5 to 7 per cent. of the total cases boarded and that about 60 per cent. of these appeals have resulted in a confirmation of the original finding.

So small a proportion of appeals is a good indication of the efficiency with which the primary boarding and assessing procedure has been conducted.

The magnitude of the boarding work since its commencement is at once apparent in the figures given in Table I.

TABLE I.—*Medical Board Examinations.*

A = Officers. B = Other ranks.

Financial year.	Resurveys.		Appeals.		Final awards.	
	A.	B.	A.	B.	A.	B.
1919-20	29,380	1,009,525	No record	12,197	Not in operation.	
1920-21	47,028	1,120,578	3,668	67,664	"	"
1921-22	31,951	791,165	2,244	42,516	"	"
1922-23	22,840	346,049	2,050	26,372	2,101	196,519
1923-24	12,575	100,659	1,521	12,746	10,210	319,844
1924-25	3,840	47,227	741	8,922	15,268	212,014

Treatment.

The pensioner having received entitlement and assessment often required medical treatment, but prior to March, 1917, little provision for this had been made. Military hospitals were available if the pensioner liked to apply, but otherwise nothing very definite was done. Article 6 of the Royal Warrant and Order of Council of 1917 completely changed the situation, for, as stated in the Minister's first annual report, "its terms are wide enough to allow of the use of all forms of medical treatment," and "by it the entire direction of medical treatment of discharged men came under the control of the Ministry." From August, 1917, full use was made of these powers.

The facilities immediately available for treatment were military and civil hospitals, but the existing demand on these institutions by men still on the active list and the increasing number of pensioners suffering from special disabilities necessitated the securing of institutions to be controlled by or on behalf of the Ministry itself. The treatment needs of the Ministry increased at a rapid rate, especially on general demobilisation. Table II. shows the development of treatment.

TABLE II.

Date.	Total under treatment.			Special institutions for treatment of war disabilities.
	Institutional.	Otherwise.	Total.	
3/4/1918	10,743	1,824	12,567	—
31/3/1919	35,948	26,605	62,553	46
31/3/1920	24,007	128,629	152,636	72
31/3/1921	26,342	122,476	148,818	113
31/3/1922	28,894	105,600	119,494	95
31/3/1923	18,402	50,788	69,190	73
31/3/1924	15,046	37,719	51,675	79
31/3/1925	10,681	28,991	40,672	70

These figures do not include cases of insanity (about a constant 6000) nor officers and nurses. A detailed analysis of these figures is given below (Table II.A).

PROBLEMS AND PRINCIPLES OF DIAGNOSIS AND TREATMENT.

The problems of diagnosis and treatment were specialised and numerous. The limbless needed limbs, face wounds required plastic surgery, "shell-shocks" demanded a remedy for their multifarious complexes and complications. The insane needed mental institutions and the tuberculous sanatoriums. Men from the East brought with them malaria, dysentery, and bilharziasis. The blind sought training, the paraplegic a home. Trench fever and D.A.H. abounded. The situation was without precedent and analogies were few. Doctors, whether clinicians or administrators, found themselves launched on a little-charted sea.

Guiding principles soon emerged, and before considering in any detail the special forms of treatment provided, it is desirable to outline the course of the provisions of treatment as a whole.

The main divisions of treatment were and are: (1) in-patient, (2) out-patient, and (3) home. Accessory to these came a combination of treatment and training, and the special requirements of limb-fitting.

The use of civil hospitals for in-patient treatment was often handicapped by the difficulty of maintaining effective coördination, and of obtaining regular reports, together with at times a lack of facilities for dealing with the specialised diseases of pensioners. The Ministry therefore, though making extensive use of civil hospitals at the same time, found it necessary to establish institutions of its own. Thus the Ministry has itself been able to develop new methods of treatment, to keep in continuous touch with the progress of the pensioner, and to maintain an adequate provision of the essential forms of treatment required. Out-patient treatment has followed the same general lines and Ministry clinics have come to form the effective basis of such treatment. Home treatment, however, naturally blended with the existing provisions for the treatment of insured persons, and has been in the hands of the local general practitioner, assisted as required by the specialist facilities at the Ministry's disposal.

Such have been the general principles and procedure of treatment provision. The details are best considered according to the types of disability treated. At the present time the conditions still requiring treatment on an extensive scale are tuberculosis, insanity, psychasthenias, and general medical and surgical diseases of a chronic type. Tropical diseases have been almost extinguished. Cardiac diseases have been more precisely diagnosed, the functional being separated from the organic. Diabetics have been given full advantage of insulin treatment, epileptics have been more accurately diagnosed.

Thus the present problems and provision of treatment differ considerably in type and extent from those of 1920. Disease as a whole is characterised by an initial acute phase, followed by a period of subsidence of activity often complicated by expected or unexpected sequelæ, and finally terminating apart from death either in cure or in chronic disability of varying degree. The treatment requirements of the Ministry have necessarily followed this general rule. The acute phase has passed, activity has subsided, and the chief need of to-day is provision for the consequential and chronic terminal manifestations.

1. Tuberculosis.

Pensioners of non-commissioned army rank, with few exceptions, were of the "insured persons" class and thus were eligible for "sanatorium benefit." Their treatment for tuberculosis was therefore already provided for through the schemes of local health authorities under the general control of the Ministry of Health. Pensioners, however, have not only been given the full advantage of the existing tuberculosis schemes of local authorities, but in several directions these schemes have been supplemented by the Ministry itself. For example:—

(1) *Treatment for Officers and Nurses.*—Arrangements have been made with sanatoriums at Matlock, Woking, Midhurst, and elsewhere for special accommodation. At Matlock and Nayland sanatoriums provision has been made for vocational training.

(2) *Surgical Tuberculosis.*—The facilities for institutional treatment for adult surgical tuberculosis under local tuberculosis schemes are somewhat limited. The Ministry has, therefore, concentrated many such cases at its own hospital at Orpington where facilities for light treatment have recently been installed and the services of specialist surgeons secured.

(3) *Observation.*—To secure accuracy in the diagnosis of tuberculosis, wards have been set apart in Ministry hospitals throughout the country for the purpose of observation by specialist Ministry medical officers, using the latest methods of diagnosis. Until recently a total of some 200 beds were so occupied, but the need for such observation is now rapidly

decreasing. The work done has been unique in scale and comprehensiveness. A full account of it has been already published in THE LANCET, 1924, i, 1195.

(4) *Treatment Abroad.*—Certain institutions in Switzerland and on the Riviera have been inspected and approved for the treatment of tuberculosis when treatment abroad was deemed essential.

(5) *Special Forms of Treatment.*—(a) *Dreyer treatment* was given by arrangement with the Medical Research Council to surgical tuberculosis cases at Orpington and to pulmonary cases at Woking Sanatorium. (b) *Light.* The recent advances in treatment by artificial light are being fully utilised and developed.

(6) *Vocational Training.*—In conjunction with the Ministry of Health extensive provision was made for vocational training, and approximately 700 pensioners have completed satisfactorily their courses in various trades and occupations.

(7) *Special diet, overcoats, and blankets* have been supplied to cases for which they were specially requisite.

As regards tuberculosis the Ministry has thus fully carried out its responsibility to secure for the pensioner the full use of existing treatment facilities and to supplement them as and when required.

2. Mental Diseases.

Under the Lunacy Acts the responsibility for the care of the certified insane rests with local authorities, with the general supervision of the Board of Control. Early in its history the Ministry made arrangements whereby any stigma of pauperism attachable to the admission of a pensioner to a county or borough asylum was removed, and "Service patients," including all those whose mental disease could be associated with the war, were given defined privileges.

The next step was to establish further the liaison with the Board of Control and to secure the regular examination by Ministry specialists of pensioners in mental hospitals. Specialist medical inspectors were appointed to conduct a systematic visitation. The discharged man pensioned for mental disease is thus very carefully looked after and his interests secured. The establishment of mental hospitals for pensioners alone was fully considered, and, although it was not found practicable to make general provision of such hospitals, arrangements have been made with two institutions—the Old Manor, Salisbury, in the south, and Storthes Hall, West Riding, in the north—for the allocation of separate wings (150 and 290 beds respectively) for the exclusive use of "Service patients." The cases selected for admission thereto are those whose mental state allows them to appreciate the advantages of such special accommodation and the scheme has proved very successful. The Storthes Hall wing is under direct Ministry control.

Arrangements have also been made for the accommodation in Ministry hospitals of suitable cases discharged "on trial" from asylums so that the difficulties inherent in sudden change from asylum to ordinary civil life might be minimised.

3. Neurasthenia.

The word "neurasthenia" has been widely used to include a large variety of conditions ranging from genuine "shell-shock" ("commotio cerebri") to functional neurosis ("emotio cerebri") and including the minor degrees of neurosis associated with the ordinary ailments and difficulties of life. Cases of true mental deficiency and inherent inability to withstand ordinary stress and strain have also been grouped in this miscellaneous class. The sorting out of this conglomeration of disabilities required time and patience. Moreover, the more acute forms of war neurosis presented novelties of aspects for which at the outset the best form of treatment was a matter of argument and indeed largely empirical. When from the mass provisionally diagnosed as "neurasthenics" those had been weeded out in whom the neurosis was merely superimposed on some definite organic condition such as gunshot wounds, heart disease, or tuberculosis, there yet remained a very large number, broadly divisible as follows:—

(1) *Borderline Cases Verging on Certifiable Insanity.*—It was the aim of the Ministry to avoid certification as long as possible. No adequate provision for the treatment of such

cases existed, though it was foreshadowed at Maudsley Hospital, and the Ministry therefore established special institutions of its own, both for officers and other ranks, where every method could be employed to cure the case, or, if cure was impossible, to postpone certification until it could by no means be avoided. Considerable success attended these efforts and the problem of the borderline case is now much less acute. To-day the hospital devoted to such cases is *Ewell* (400 beds), which now serves as the centre to which all such cases in "other ranks" are deflected. For officers, *Latchmere* (58 beds) serves a similar purpose.

(2) *True Neurasthenics.*—Numerous special hospitals and clinics were established to treat these cases, and arrangements were made for the training of doctors in the technique of psychotherapy. Psychotherapy by itself, however, in a considerable number of cases did not produce more than "alleviation," and the reputedly cured neurasthenic was very apt to relapse seriously so soon as he had to face for himself the full stress of life, especially when associated with unemployment or domestic worries. Neurasthenia, moreover, was a too easy refuge for the work-shy and pessimist. Substantial progress in diminishing the numbers of neurasthenics requiring treatment was attained by combining definite *occupational treatment* with psychotherapy. Workshops, with workshop officers, were attached to the neurasthenia hospitals and efforts were made to secure suitable employment for the pensioner on discharge. Prolonged clinic treatment was discouraged and the chronic case was brought into hospital for occupational treatment. These measures not only produced cures, but also enabled the specialists to identify more accurately the different types of neurasthenics and to separate out the mentally defective, the epileptic, and the man who was making the most of his disability. Specialist medical inspectors constantly visited the hospitals and aided in this classification.

The number of true neurasthenics still under treatment is now less, as is also the number of hospitals, beds, and clinics allocated to them. There still remains, however, a need for further "vetting" and final decision as to future treatment and pension in many cases.

(3) *Mental Defectives.*—The frequency of this type became very obvious in the progress of the eliminative processes described above. These cases failed to react effectively to any form of treatment and deteriorated on return to the unsheltered conditions of home life. Many caused and got into trouble by their generally irresponsible conduct and habits. Others, whilst proving tractable patients in an institution, had not the stamina to maintain them in home conditions. In short, it became apparent that the only adequate treatment was the provision of shelter from the stress of life, a shelter necessary both in the man's interests and in those of his family and associates.

In 1923 Saltash, no longer needed as a convalescent centre, was adapted as an institution for the reception of cases from groups (2) and (3) above, in whom experience had shown to exist a complete incapacity to maintain even relative normality save under institutional conditions. Occupational treatment was fully developed, and the scheme proved so successful and necessary that in 1924 Harrowby Camp, previously a general neurasthenia hospital, was transformed to the Saltash type. A total of 650 beds is now available for this type of case. This provision by the Ministry is unique and, indeed, epoch-making as a practical effort to deal with a problem which is a national one and not solely one affecting pensioners. The time is now approaching when, apart from institutions of the borderline and Saltash types, there will be no need of special neurasthenia hospitals, adequate accommodation being obtainable by the use of separate wards in general hospitals. The need for neurological clinics is also less, but there will remain for a long time the necessity for a limited number of such clinics.

A large proportion of neurasthenics have been eventually disposed of by transfer to treatment and training centres, such procedure consolidating the improvement produced by occupational treatment in hospital. The in-patient figures for past treatment indicate that there have been over 50,000 separate admissions for courses of in-patient treatment for "neurasthenia."

4. Epilepsy.

A primary difficulty has been accurate diagnosis. Many cases so labelled proved to be, in fact, suffering from other organic diseases or to be truly functional. Maghull Hospital (300 beds) has been largely devoted to the precise diagnosis of "epileptics," and following this appropriate treatment has been given. The

Ministry has, however, had no institution of its own for colony treatment of epilepsy, and the demands on existing colonies—e.g., Lingfield and Chalfont—have been so heavy as until recently to entail long waiting lists. The task of diagnosis has, however, now been largely concluded, and Maghull is being used to a greater extent for prolonged treatment as well as observation.

5. Paraplegics.

These unfortunate men require institutional treatment of a type as home-like as possible, and for this purpose various small institutions have been used, where every comfort is provided for the pensioner fated, probably, to spend the rest of his days in a paralysed condition. With the opening last year of the Star and Garter Hospital, Richmond, additional accommodation has become available.

6. Organic Nerve Diseases.

This term is used to include traumatic injuries of nerves as well as general nerve degenerations. Mention must be made of the surgical skill which has been expended on the suture of nerves followed by re-educative exercises and massage, in many cases with gratifying success.

7. Facial Wounds.

Perhaps in no department of war and post-war surgery have such amazing results been obtained as in the treatment of facial injuries. Men with jaws and face smashed to shapeless pulp have been re-created in human form. Infinite patience, the most delicate technique, and sheer genius for this special task were happily at the disposal of the Ministry in the services of its facial surgeons, and the special hospital at Sidcup is world-renowned for the work done under its auspices. Happily the need for such work is now slight, and the Sidcup hospital has changed in function. Since March, 1920, however, 2944 facial operations have been performed there, of which 1156 were specialised jaw and dental work. The value and wonder of this work cannot be expressed in words. It can only be fully appreciated by those who have actually seen the miracle performed, the building up of a human countenance out of a repulsive mass of flesh. For the patients themselves, doomed as they thought to mere existence, shunning the ways of men, their distorted lips and eyes unable to express their human emotions, it has meant rescue from a living death.

8. Diabetes.

In 1923 the value of insulin for this disease became well established. The Ministry at once arranged for its provision at Orpington to all suitable cases. In the promptitude and extent to which insulin was used the Ministry was well in the forefront. Between June, 1923, and April, 1925, 215 cases (30 officers, 185 other ranks) diagnosed diabetes were sent to Orpington, and 178 given insulin treatment; 23 were found to be suffering from a less severe though analogous condition, but for which insulin was unsuitable. In a large number of cases definite success has followed the treatment, symptoms have disappeared, and the pre-diabetic body-weight has been regained. Each man, before discharge, has been carefully educated in the technique of continuing insulin treatment at home under the care of his doctor and the doctor fully informed of the treatment already given.

In this, as in other directions, the Ministry medical services have secured promptly for the pensioner the full value of the latest medical research. A further example may be cited in the speedy and universal use by the Ministry of the recently developed technique in the estimation of nephritis.

9. Tropical Diseases.

In its early history the Ministry's medical services had to deal with very large numbers of malarias, dysenteries, and other tropical diseases. Malaria was treated by intensive methods and is now rarely met with in active form. Pioneer and successful work was

done in the pathology and treatment of dysentery, though there is still need for allocation of about 140 beds in Ministry hospitals for the treatment of intractable chronic dysenteries.

Startling success followed the introduction of the treatment of bilharziasis by antimony tartrate. As far as war pensioners are concerned bilharziasis has been extinguished. Pensioners of former wars have also been treated with equal success. The present need for tropical disease treatment is now very slight—a testimony to the efficiency employed in dealing with them.

10. Wounds and Injuries.

Enormous numbers of these required treatment, and special surgical hospitals were required on an extensive scale.

Operative procedure has been supplemented by *massage and electrical treatment*, a special Ministry *massage service* being established in January, 1920, and speedily numbering 500 members. Specialised *gymnastic treatment* has been given and the X rays utilised in all their latest developments.

The treatment of *penetrating wounds of the skull and brain*, a branch of surgery peculiarly the province of the Ministry, has been greatly advanced and many cases have, through specialised operations, regained a surprising degree of physical and mental fitness.

Gunshot wounds of the chest, often with foreign bodies retained in the lung, have also been treated with surprising success. At Shepherd's Bush Hospital some 250 cases have been operated on with uniformly satisfactory results, and not a single fatality.

The serious and often novel disabling results of the persistent rain of high explosives during the war have thus been largely counteracted, and wounds of head and chest which in pre-war days would have been considered beyond surgical skill have been repaired and remedied to an unlooked-for extent. Certain wounds, apparently soundly healed, but with bullets or other foreign bodies unremoved, have, however, from time to time suddenly "flared" up into serious activity necessitating further surgical interference, sometimes to an extensive degree. The need for surgical beds has thus not diminished so speedily as had reasonably been expected, and there also still remains a considerable number of chronic surgical conditions of a type very resistant to treatment.

Linked closely with the primary treatment of wounds has been treatment combined with training in trades practicable for disabled men, and a large proportion of the wounded have been passed through the treatment and training centres or referred direct to the training centres of the Ministry of Labour.

The extent of the work of a special surgical hospital is shown in the fact that Shepherd's Bush Hospital from August 1st, 1919, to its closure in March, 1925, dealt with 22,641 other ranks and 771 officers as in-patients.

11. Limbs and Appliances.

"Go to the wars would you," says Boulton in Shakespeare's *Pericles*, "where a man may serve seven years for the loss of a leg, and have not money

TABLE III.

Year ending March 31st.	Limbs supplied.		Repairs to limbs.
	Legs.	Arms.	
1920	15,621	3,456	12,556
1921	15,391	4,746	19,901
1922	9,469	3,937	26,616
1923	7,589	1,230	33,489
1924	9,255	1,201	31,438
1925	11,102	1,289	34,013

enough in the end to buy him a wooden one?" The Great War limbless pensioner has been given not a wooden leg but the latest product of the artificial limb-maker's art and a duplicate as well. Witness these figures as to limbs and appliances (Table III.).

At the end of March, 1925, the Ministry was responsible for artificial limbs in 37,178 pensioners, of whom 1782 were officers. In the year ending March 31st, 1925, 18,470 pairs of *surgical boots* were issued, 1180 being first issues, and 18,847 pairs were repaired. Other *surgical appliances*—e.g., belts, trusses, spinal supports—were supplied in 16,053 cases, 3970 being first issues. *Artificial eyes* were fitted to 3389 pensioners and *spectacles* to 733, in many cases special types of eye or spectacle being necessary. Up to March 31st, 1925, 4873 *hand propelled tricycles* and *invalid chairs* had been issued.

The Ministry, by constant conference and experiment, has given the most careful and specialised attention to discovering a fully effective form of artificial limb and has provided the improved types of light metal limbs. Most leg amputations can now be fitted with an artificial limb weighing not more than 4-5 lb. in place of a previous average of about 7 lb. The mechanical facilities developed in the artificial arms supplied are surprisingly effective. Efficient arrangements have been made for the renewal and repair of artificial limbs, and limb-fitting centres have been so established that such renewal or repair is assured with a minimum of inconvenience to the pensioner.

12. Cardiac Diseases.

Here again precise diagnosis was urgently necessary to separate out cases with definite structural lesions from those with functional, non-structural (often neurasthenic) conditions. Eminent cardiac consultants gave their assistance in this process. The treatment of both types has been made more effective, especially by means of graduated physical exercises, and the majority of cardiac cases still under treatment are of the chronic and advanced class for which alleviation rather than remedy is alone possible.

13. Other Special Conditions.

Mention must be made of the extensive treatment facilities, in-patient and out-patient, provided for *eye and ear diseases*. Numerous courses of lip-reading for the deaf have been given, and for the blind a close association has been maintained with St. Dunstan's.

Dental defects attributable to war service or closely correlated with pensioned disabilities, such as gastritis and rheumatoid arthritis, have been extensively remedied. Five whole-time specialist dentists have been appointed to co-ordinate and supervise the work carried out by a large panel of practising dentists. By this supervision great economy and efficiency have been attained.

Convalescent homes have been utilised as required. For *rheumatic* conditions spa treatment has been fully employed in suitable cases.

14. General Medical Disabilities.

The more specialised diseases having been appropriately dealt with, there yet remains a medley of miscellaneous disabilities of a chronic or recurrent character, such as bronchitis, asthma, myalgia, and rheumatism, for which definite facilities for more than home treatment are still required at hospitals of a general type, at general clinics, and out-patient departments. These conditions by their nature will continue to require special attention, the more so through their tendency slowly to deteriorate from year to year, or to develop sequelæ demanding more urgent treatment.

15. Treatment Combined with Training.

The extensive provision of this has been already mentioned in reference to neurasthenia, tuberculosis, and surgical disabilities. The object was to meet the need of pensioners whose disabilities prevented them resuming their pre-war employment, and who required training in a new occupation concurrently with the treatment of their disabilities. Close liaison has been maintained with the Ministry of Labour. At the present time the work is nearly finished, only one Ministry centre (Rednal, Birmingham) remaining

open. In the past five years, however, treatment and training has been provided to about 12,000 pensioners, and in addition about 5000 have been transferred direct to the training schemes of the Ministry of Labour. The courses provided have included engineering, carpentry and joinery, french polishing, upholstery, painting and decorating, tailoring, watch and clock repairing, market gardening, commercial subjects, &c. The results in general have been good, but the persistent congestion of the labour market has not made it easy for the disabled man, however well trained, to compete with the physically fit civilian. At one time 3300 beds were available in a total of five Ministry centres.

16. Laboratory Investigations.

Modern diagnosis and treatment rest on accurate pathological and bacteriological investigations. Pathological laboratories were established at various centres, but this work has been increasingly concentrated at the Ministry Laboratory in London (recently at Cheltenham-terrace, now at Bulinga-street). This central laboratory is as finely equipped as any in the country, and has performed an amount of work which measured by figures is enormous and in practical value inestimable. The medical staff there has kept in touch with all the latest research. Improvements in technique have been introduced and advances in knowledge made which entitle the Ministry to claim that its pathological services are second to none.

17. Medical Stores and Supplies to Hospitals.

Efficiency and economy have followed the conduct of these essential services by a special branch established in 1919.

18. Nursing.

With the development of Ministry hospitals a Ministry nursing service became necessary and was instituted in June, 1919, the staff at the end of that year numbering 28 matrons, 212 charge sisters, 268 nursing sisters, and 214 assistant nurses. The present staff is 30 matrons, 12 assistant matrons, 216 charge sisters, 298 nursing sisters, and 70 assistant nurses.

19. Miscellaneous.

Many accessory items in the general work deserve mention. The introduction and development of *record cards*, whereby a continuous account of the pensioner's medical history is made available for all directly concerned with his treatment or boarding; the grants of *constant attendance allowance* for blinded and other pensioners so seriously disabled as to be unable themselves to perform without aid the common functions of life; the arrangements with the *colonies* and with *consuls* in foreign countries for the provision of boarding and treatment facilities abroad as nearly equivalent as possible to those provided in this country.

20. *Officers and nurses* have been dealt with broadly on the same lines as "other ranks" except that separate institutional accommodation has been provided for them. A considerable number of officers' hospitals or officers' wards have thus been necessary, but at the present time only two Ministry hospitals (Rotherfield Court and Latchmere), both for neurasthenics, are solely devoted to officers, and one (The Spring, Hanwell) to nurses. As few officers come within the provisions of the Insurance Act the arrangements for their home treatment have been a direct concern of the Ministry involving much personal communication with doctors and officers. At the present time over 3000 officers and about 330 nurses are in receipt of treatment from the Ministry. The total other ranks now under treatment is approximately 47,000.

CONCLUSION.

Any condensed account of the work and scope of medical services inevitably resembles a catalogue embellished with statistics. A recital of facts and

figures can convey but a general impression of the work done and that yet to be accomplished. The war with its aftermath of sick and wounded was a direct challenge to medical science. The challenge was gladly taken up, and under the ægis of the Ministry of Pensions the clinicians, surgeons, and administrators of the profession have united to exercise and develop to the utmost the resources of their art. The victory has not rested with, but has been wrested from, disease.

I am indebted to Major the Rt. Hon. G. C. Tryon, M.P., Minister of Pensions, for permission to publish this article.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 350.)

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

(App. LXVII. and Q. 18437-18518.)

THIS Society submitted proposals for the inclusion of massage and electrical treatment as an additional benefit to be provided by approved societies, when prescribed by a medical practitioner, for persons insured under the National Health Insurance Scheme. Evidence was given by Sir Cooper Perry and Dr. James Mennell.

The rules of the Society provide that its members are not to undertake any cases of massage except under the direction of a registered medical practitioner; not to advertise except in recognised medical and nursing papers; not to sell goods to patients in a professional capacity, and not to accept secret commissions on the sale of goods. Over 5400 masseuses and masseurs are now registered with the Society, and the majority are qualified to administer, under medical directions, the treatments by massage, remedial exercises, and medical electricity now so generally ordered for a variety of medical and surgical conditions.

The certificates granted by the Society are recognised by Government departments and the medical profession generally. Written evidence of the value of the treatment, and the increasing recognition of it, was submitted from Mr. R. C. Elmslie, orthopaedic surgeon to St. Bartholomew's Hospital, and from Sir Robert Jones, who said:—

There are many conditions of which it must be said that physical treatment offers, if not the only hope of cure, at any rate, the only hope of saving prolonged and tedious convalescence. . . . It is not infrequently possible by the use of physical treatment to reduce the duration of disability by anything from a half to two-thirds, while at the same time rendering the liability to recurrence comparatively small.

The witnesses estimated that 2 per cent. of the insured population would require physical treatment annually—that is, 300,000—and the average cost per patient would be £5 10s. This would mean a total yearly expenditure of £1,650,000, or rather more than 2s. per head of the insured population.

Massage treatment would probably best be administered as part of a hospital service. There is, in any case, probably a higher percentage of insured persons receiving massage treatment in hospitals than at home from their panel doctors, mainly because the accident cases usually go to hospital. There is, however, more medical than fracture work amongst hospital cases, roughly two-thirds medical and one-third surgical.

* References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

Sir Cooper Perry agreed with Sir Humphry Rolleston's suggestion that there might be a progressive increase in the use of massage amongst the general population, so that the 2 per cent. estimate might prove to be a considerable underestimate in a few years' time.

IVORY CROSS.

(App. LXVIII. and Q. 18519-18657.)

The evidence on behalf of the Council of the Ivory Cross was submitted by Mr. Charles Davis, Mr. H. D. Grant, Mr. John Hale, and Miss A. E. Fletcher.

This Society began by providing dental treatment for soldiers and sailors, and then went on to pensions, but lately have been providing for the population at large. Their income varies from £5000 to £27,000 a year, and it is their practice to require patients who can afford to pay something towards the cost of treatment to do so, as they appreciate it so much more. About 25 per cent. get free treatment; about 6 per cent. give from 6d. to 10s.; about 10 per cent. give £1; about 30 per cent. give £2; and about 8½ per cent. give £3.

The witnesses said that they objected very strongly to clinics, and they try to provide that in the service, which is always given at a private surgery, there is no distinction between patients.

(Q. 18643.) Taking your organisation, is there not a taint of charity about it?—There is in the name only, but not in the way the patient is treated. That is the whole secret of the Ivory Cross. The patient comes to me by appointment made by me to see me. He or she comes to my house. The maid who opens the door does not know that she is not a private patient. She enters my surgery. My nurse-secretary tells me who she is and produces her chart, and that is the first time that it is known that she is from the Ivory Cross. There is nobody outside my surgery knows, and she is treated in every way as a private patient. There is no question of charity thrust at her or thrown at her in any way.

The Society is in favour of dental benefit being made a statutory benefit available for all insured persons, if it can be done without creating a state of affairs disadvantageous to the profession. Payment, it was considered, must be on a case basis and not a capitation basis, and it was recognised that there would have to be a scaling down of bills as in the system of payment of panel doctors in force in Manchester and Salford.

SCOTTISH PANEL CHEMISTS.

(App. LXIX. and Q. 18658-18892.)

The General Council of Panel Chemists, Scotland, whose secretary, Mr. J. Rutherford Hill, gave evidence, is of opinion that medical benefit administration through insurance committees and under the panel system should be continued.

Prescribing by panel practitioners in Scotland, as a whole is on a very high level, and the relationship between practitioners and pharmacists is one of mutual respect and confidence and helpful coöperation. The matters referred to as needing amendment are comparatively few and are mentioned with a view to their elimination, so that a service already on the whole satisfactory may be brought still nearer to the ultimate ideal. These remarks apply equally to the pharmaceutical service.

There is a difference in the way in which the drug tariff is prepared in Scotland as compared with England and Wales. In Scotland the chemist has a commercial profit on the drug supplied and a professional fee for dispensing it. In England the chemist gets the net wholesale cost of the drug plus a flat rate for establishment charges, plus a dispensing fee. Notwithstanding the lower tariff charge for each item in England the cost per head is greater than in Scotland. As an explanation of this Mr. Hill suggested:—

(Q. 18729.) As a rule the medicines are more concentrated. The dosage is small, and where a bottle of medicine

would require to be repeated probably three or four times in England, one bottle would do for that patient under the Scottish system.

Mr. Hill said that from the beginning there has in practice been ample freedom in the choice of medicines, and it has never been suggested or admitted for a moment that the cost of medical treatment should be allowed to debar any sick insured person from receiving first-class treatment or the use in ample amount of any drug however costly it might be. On this the witness was asked:—

(Q. 18678.) One sometimes hears it said that it is true in theory but not in practice. What do you say to that? That while a doctor may in theory prescribe anything he likes, in actual practice he is constantly being badgered about the expense of drugs, and told to keep it down?—That is, I would say, a misunderstanding in some quarters. It is not true so far as my experience goes. No doctor has ever been challenged on the cost of his drugs as a question by itself. . . . It is discovered sometimes that a practitioner in a district in treating his patients spends three or four times as much money as his neighbour practising in the same district among the same class of people, and that is inquired into.

As regards the arrangements for securing proper economy it was thought that the responsibility for initiating action should be vested in some competent central authority, and the invidious onus of so doing thus removed from the local committee.

Another suggestion put forward was that there should be prohibited the prescribing under a proprietary name of medicines which are well-known definite chemical substances, and the prescribing of secret remedies the composition of which is not adequately disclosed.

Generally speaking, it would be a distinct advantage if the prescribing of proprietary medicines was discouraged and sanctioned only in the case of some new medicament which is a new remedy and for which there is no equivalent non-monopoly substitute.

PRACTICE AMONG THE HIGHLAND CROFTERS.

(App. LXX. and Q. 18893–19171.)

Dr. Alexander Asher, who is a general practitioner in Thurso, Caithness, and in a wide surrounding area, gave an account of his practice, which includes a large number of crofters, small farmers, and fishermen. He said that he sent his operation cases to Inverness and Edinburgh, and that urgent cases were usually admitted at once; his patients generally preferred to go to Edinburgh. Notwithstanding his wide and scattered district, he did not do any dispensing himself excepting in emergencies; the prescriptions were generally taken to Thurso by carrier, &c., and dispensed there.

Dr. Asher thought that compulsory health insurance for crofters and share-fishermen, who are at present outside the Act, would prove a great boon. He suggested that local administration of money insurance benefits in the Highlands and Islands should be in the hands of the clerk to the parish council, and that a county rate not exceeding 2d. in the £ should be raised for the purpose of providing hospital, nursing, and specialist services.

NATIONAL FARMERS' UNION OF SCOTLAND.

(App. LXXI. and Q. 19172–19399.)

The evidence in this case was given by Mr. J. C. Henderson, whose principal contention was that the agricultural industry had been paying an undue share of the burden of National Health Insurance, because agricultural work was a healthy occupation, as shown by the large surplus of the Rural Workers' Friendly Society. It was the contention of the Farmers' Union that contributions should be levied on the different industries according to their claims experience, as in ordinary insurance practice, and the greater part of the examination of the witness was devoted, without apparently much success, to trying to get him to recognise that his proposal would involve insuperable administrative difficulties.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Irish Free State and the Medical Register.

THE medical profession of the Irish Free State has been taken aback by the sudden announcement made last week by the Executive Council that the Government had decided to establish an independent Medical Register for the State. Last April the Government asked for the views of the medical profession through its several organisations and corporations, and the medical faculties of the universities. The unanimous opinion of the representatives of these bodies was in favour of maintaining the present system of registration in common with Great Britain. Mr. James Burke, Minister of Local Government and Public Health, whose department dealt with the question, expressed his agreement with the opinion of the medical profession, as put before him, and stated that it was the intention of the Government to pass into law a measure establishing the existent system on a permanent basis. He invited the medical representatives to nominate a small committee with whom he could consult from time to time as occasion might arise. No further consultation took place, and last week this committee was summoned, not to consult with the Minister, but to hear the announcement that the Executive Council had decided to establish a Medical Register for the Free State.

If the decision to establish a separate Register for the Free State is carried out, it can hardly fail to affect the medical schools of Ireland adversely, at any rate for a time. What rights or privileges medical men educated in Ireland may in future be given as regards admission to the General Register must remain uncertain for the present. More than half the graduates and licentiates of the Irish schools practise outside the Free State, and until new arrangements are complete students are unlikely to enter the Irish schools; while they cannot ascertain what may be their future prospects, they will go where they can gain access to the wider Register. In fact, the immediate result will almost certainly be that Irish medical students will seek their education outside the Free State. Unfortunately, the medical schools of the Free State, in Dublin, Cork, and Galway, possess very little endowment, and are almost entirely dependent on the fees of their pupils for ability to carry on. Even a temporary absence of students will mean a severe crisis, and it is hardly too much to say that extinction may follow for some of them. The position is a serious one, and requires very careful handling both on the part of the Free State Government and of those who will have the responsibility of presenting the position from the standpoint of the medical profession. It is to be hoped that the decision of the Executive Council is not irrevocable.

Free State Army Medical Service.

A revision has been made in the scale of salaries of the medical officers of the Irish Free State Army Medical Service. The positions of Major-General and chief sanitary officer, which carried salaries of £1500 and £1250 a year respectively, have been abolished, the highest rank now being that of Colonel, with a salary of £1400 a year. The other ranks in future will be Lieutenant, Captain, and Commandant. The initial salaries in each rank will be 12s. a day, £1 6s. a day, and £1 17s. a day, with periodic increase of salary, rising after five years' service to maxima in each rank of £1 5s., £1 15s., and £2 7s., respectively. As compared with the previous scale the initial salaries are lower, but certain officers after five years' service will receive higher pay than under the old scale.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Medical Qualification in Transylvania: a Harsh Position.

THE peace of Trianon has created a curious situation for our medical students. Nominally, before dissolution of the Empire, Hungary had two universities with medical faculties, one at Budapest, the capital, and the other at Kolozsvár, the capital of Transylvania. While the Budapest University had from 4000 to 4500 medical students, the Kolozsvár University modestly provided for between 400 and 500 students. This was due to the fact that the Budapest medical faculty had the best possible equipment, its members in the years immediately preceding the outbreak of the war having been sent to Vienna, Berlin, Paris, and London to study medical institutions and to copy what was best. The Government did not spare money, and the clinics of the Budapest University inspire the greatest enthusiasm among those who see them. Foreign visitors to the International Medical Congress of 1909 held in Budapest retain a vivid memory of the Budapest clinics; in fact, numerous English and American physicians later came to Budapest for post-graduate medical study. Even Transylvanian students preferred to go to Budapest, not excepting students from Kolozsvár itself. These Transylvanian students, having begun their studies in Budapest, finished in Budapest when Transylvania was torn away from Hungary. When the Roumanian Government took over the Kolozsvár University they employed Roumanian professors and the language of the University was changed to Roumanian, which was a foreign tongue and is still almost foreign to most of the Transylvanian students. As Transylvania is a large territory the number of medical students who were nearing the completion of their studies in Hungary amounted to about 1000. These students, not speaking the Roumanian language, preferred to finish their studies in Budapest, Szeged, Pécs, and Debretzen (the four universities of Hungary) and pass the final examination in the language with which they were familiar. However, when they received their diploma in Budapest or in one of the other three universities, and came home to Transylvania, they received the surprising news that they were not allowed to practise in their own land with Hungarian diplomas unless they passed the final examination in Roumanian. This entailed new work for the students, and it meant at least a year's loss to them. This regulation hurt them the more in that the whole administration of Transylvania remains at present as it was under Hungarian rule.

Salzer Treatment of Stricture of Œsophagus.

Prof. János Bokay, of the Pædiatric Clinic of Budapest University, has made experiments with the Salzer method of treatment for cases of caustic poisoning followed by stricture of the Œsophagus. Swallowing potassium hydroxide is a frequent accident in Hungary. Owing to the great economic hardships the wives, even in the middle classes, are now forced to work in offices, millineries, and such like places, leaving the supervision of their children in the hands of the eldest child or of neighbours. Such families live in one room, which, of course, serves as the kitchen, and children have access to bottles containing the alkali. The Salzer method of treatment consists in applying the No. 30 Bass sound, which is a heavy Œsophageal sound filled with small shot and soaked in warm water to make it flexible. The treatment is begun from the third to the sixth day following the accident. The sound is left in the Œsophagus for half an hour and is reapplied every three or four days for several weeks. While Salzer published accounts of 34 cases thus treated, Prof. Bokay has reported 122. In 110 of these cases no strictures developed. The results were less satisfactory in five of his cases because the treatment could not be applied regularly. There were

seven fatalities; in three death was due to perforation of the Œsophagus followed by mediastinitis, and in four death was due to the poison itself. Prof. Bokay strongly advises the use of this method of treatment for adults as well as children.

Large Doses of Iron in Pernicious Anæmia.

Dr. Rausch, of the Third University Clinic, Budapest, has put the Lichtenstein, Lindberg, and Barkan method of treating pernicious anæmia to the test. These workers recently recommended for anæmia doses of iron ten times as large as those in general use up to the present. They have obtained good results without any gastric troubles worth mentioning. Following their example Dr. Rausch gave reduced iron in daily doses of $\frac{1}{2}$ g., to be taken in wafers, always before meals, so that any particles of iron possibly adhering to the teeth might be removed by subsequent mastication. In cases of pernicious anæmia in which other remedies had failed he tried on the first and second day 0.5 g. ferri redacti, twice daily, then for two days 0.5 g. four times daily, and then for two days or more 0.5 g. six times daily. No injuries to stomach or intestines have been observed following this therapy. Decided improvement was noted in two out of five cases and a transient improvement in two cases. This method certainly deserves a trial, as it evidently exercises a strongly stimulating effect on the blood-forming constituents of the bone-marrow in cases which are still capable of improvement.

Insurance Doctors' Fees.

The medical advisers of life insurance companies have started a movement here to induce the insurance companies to pay medical fees in proportion to the depreciation of the currency from its normal rate of exchange. The fees at present are much less than formerly. The lowest fee for an insurance certificate in pre-war times was 10 crowns (8s. 4d.); the fee at present does not amount to 5s. As the ratio of the face-value of the policy to the premium is the same that it was in pre-war days, the medical advisers insist on being paid on the same basis. Physicians are ready to refuse medical examinations for insurance companies if the latter are obdurate.

Appeal for Legislation to Regulate Medical Advertising.

Prominent members of the medical faculty have appealed to the authorities to amend the law regulating advertising, and provide that the editors of newspapers, journals, and other publications shall be held responsible for all advertisements or other matters published referring to the practice of medicine or dealing with secret remedies. Advertisements should be held to be of a secret character when they relate to the treatment of any disease or affection without medical confirmation, where the testimonials are not signed by physicians, and where the declarations of treatment are simply guaranteed by laymen or groups of laymen. Penalties, it is urged, should be provided for infractions of these rules.

WIGAN INFIRMARY X RAY DEPARTMENT.—The board of management of the Wigan Infirmary have decided to proceed with the erection of a new X ray department and with the necessary equipment for artificial sunlight treatment. The cost of the building and equipment will be about £9000.

MEMORIAL TO DR. MARY STURGE.—The Medical Women's Federation, of which the late Dr. Mary Darby Sturge was president from 1920 to 1922, has issued an appeal for subscriptions to a memorial fund. Dr. Sturge, who died in March last at the age of 62, was honorary physician to the Birmingham and Midland Hospital for Women and joint author with Sir Victor Horsley of "Alcohol and the Human Body." The money which is to be raised will be presented to the Taylor Memorial Home of Rest for Women at Birmingham for the dedication or endowment of a bed. Dr. Sturge was one of the founders of the home, and just before her death she inaugurated a scheme for the erection of new quarters for the nurses. These are now complete and the building has been named the "Dr. Mary Sturge Wing."

Public Health Services.

MENTAL HOSPITALS SERVICE.

Barnwood House Hospital for the Insane, near Gloucester, has accommodation for 150 patients, 15 of them voluntary boarders. The aim of the hospital is to admit recoverable patients and not to use the accommodation for chronic cases. The pathological work is at present dependent on Bristol University, but a pathologist has recently been appointed to the Gloucestershire Royal Infirmary and will undertake the work of this hospital. The medical superintendent calls the attention of his readers to the need for out-patient clinics for incipient cases. Such clinics do not appear to have been established in Gloucester yet. A renovation of the cowsheds of the institution has been undertaken in order to ensure milk-supply under the best conditions. The greater part of the report consists of statistical tables. A curious anomaly appears in the name of the institution, which avoids the obsolete "asylum" and yet retains the almost equally objectionable word "insane."

The Retreat, York.—The 128th annual report shows that the work there is being carried on at the previous high standard. The number of voluntary boarders reaches the high figure of two-thirds of the total inmates. The recovery-rate is 32 per cent. and the death-rate 10 per cent. The malarial treatment of general paralysis is being continued and one patient has been discharged apparently cured. Although there seems no doubt that this treatment profoundly modifies the course of the disorder, each case seems to be a law unto itself. The problem of occupation therapy is being tackled with ingenuity and perseverance, and a great deal has been done to increase output and introduce simple and attractive handicrafts. The universal sense of need for early treatment is being felt by the medical officers, and they are hoping to approach it on somewhat original lines. The report includes an outline of the history of the institution, photographs, particulars from the point of view of patient and nurse, and some useful statistical tables.

The Lady Chichester Hospital, Hove, was a pioneer among institutions for cases of early nervous breakdown. The work is being carried on to the limit of financial possibility and there is always a long waiting-list for the 40 available beds. By far the greater number of cases are able to return to normal life when they leave the hospital; a few go to convalescent homes or become daily out-patients, living outside but spending their day in the easier environment of the institution. All the usual methods of treatment are employed at discretion, particular stress being laid on fresh air and generous diet. Search is made for septic foci, and hydrotherapy and electrical treatment are applied to suitable cases. All kinds of "occupational therapy" are employed, handicrafts, gardening, housework, and work for the annual bazaar being the chief features. Old patients keep in touch by means of the "club night," a weekly entertainment or dance to which all old patients are welcomed. There is no doubt that the work carried on is invaluable for a certain class of patient, and there is scope for considerable extension of the work when funds are available.

Glamorgan County Mental Hospital, Bridgend, supports 1800 mental patients. There is a larger proportion than usual of the congenital class and of recurrences: indeed, the medical superintendent reckons that 70 per cent. of the patients under his care may reasonably be assumed to be beyond hope. The death-rate for the year was 8.4 per cent. The high incidence of tuberculosis and dysentery, partly due to the overcrowding of the premises, has been reduced. A consulting surgeon has been appointed and a local dentist attends when necessary. Every effort is made to interest the junior nursing staff in their work, and 27 have passed the junior examination for the certificate of the Medico-Psychological

Institute, but the proportion of failures is very high. The new house, Glan Rhyd, for convalescent male patients on parole is proving very successful, and only eight cases have abused their parole during the year. The report includes notes by the three chaplains and full statistical tables.

The report of the *Staffordshire Mental Hospitals Board* includes the three institutions under the direction of that body. At the *Stafford Mental Hospital* over 1100 cases have been under treatment during the year, the continued steady increase making the question of additional accommodation an acute one. The death-rate has been 6.33 and the recovery-rate 29.33 per cent. among men and 37.69 per cent. among women. The medical superintendent emphasises the importance of early treatment by showing that in 60 per cent. of the recoveries the duration, prior to admission, was less than two weeks, and was over three months in 11.3 per cent. only. The very low tuberculosis death-rate is attributed to the unremitting attention given to ward hygiene and diet, in which the inclusion of "marmite" has played some part. There has been no diarrhoea or dysentery. The installation of electric light and vacuum cleaners has much improved the condition of the wards. From the pathological department two papers have been published: (1) on the production of formaldehyde by intestinal bacteria in connexion with the ætiology of nervous breakdown, and (2) observations on the types of blood-sugar curve found in different forms of insanity. The latter embodied very extensive research and suggested interesting and important differences in metabolism between the sane and insane. In addition, the histological condition of the ductless glands in mental patients has been the matter of investigation.

Burntwood Mental Hospital (Staffs. Co.) has 900 patients, and the general health has been maintained at a high standard. In addition to routine work in the laboratory Dr. G. F. Cobb has been carrying on an investigation into the chemical aspects of epilepsy. The work of the dental surgeon has been of much value.

Cheddleton Mental Hospital (Staffs. Co.) is overcrowded with 1045 patients, including cases of mental defect, and there is a shortage of nurses. Many structural renovations have been put in hand and many more are required. The arrangement of the dietary scale is made difficult by the absence of any gas-supply for cooking. Cheese and marmite are relied on for the supply of vitamins A and B respectively. Orthopædic treatment is to be commenced for suitable cases, and the nurses are to have special training in education methods for the mentally defective. In addition to routine work carried on in the laboratories Dr. F. H. Stewart has investigated the chemistry and bacteriology of intestinal toxæmia. He has found that one variety of non-lactose fermenting organism is regularly present in the fæces of chronic patients when they are undergoing acute exacerbations. The principles of parole and open-air wards are employed with success.

Carmarthen Mental Hospital has 600 patients. The work is hampered by inadequate water-supply and drainage, but a recovery-rate of 36.44 per cent. has been obtained. The cases of excitement greatly exceeded all other forms of insanity on admission. Of the 43 cases discharged as recovered 74 per cent. were in residence for less than a year. The death-rate is 7.79, the proportion attributed to tuberculosis having much diminished. It is hoped to improve the amusement facilities and dietary in the near future.

West Sussex County Mental Hospital, Chichester—The report records a successful year of work. The 760 patients include private and ex-Service cases. There has been a recovery-rate on the admissions of 25 per cent. with a further 25 per cent. relieved. Special stress is laid on the restoration and maintenance of physical health; every new case is examined as a routine by the specialists in medicine, surgery, diseases of the eye, throat, ear, and teeth; and ten successful operations have been performed. There is complete freedom from infectious

disease and only nine cases of tuberculosis are under treatment. Occupational treatment is provided in the farm, grounds, and workshops, and in the domestic departments for women. Parole is given wherever possible. The medical records have been supplemented by nursing report sheets, which have been most carefully kept and have proved a valuable and illuminating addition to the records. A large proportion of the nurses hold the certificate of the Medico-Psychological Association.

Hertfordshire County Mental Hospital, St. Albans, accommodating 1180 patients, shows a recovery-rate of 33.8 per cent. and a death-rate of 6.11 per cent. Extensive use is made of the parole and discharge-on-trial systems and the provision of money grants where needful. Several major operations have been performed and 110 patients have received attention from the dental surgeon. Clinical rooms have been provided in connexion with the admission and infirmary wards, affording opportunity for valuable private interviews. Many of the nurses hold, or are training for their certificates, and the nursing of sick male patients by women has proved satisfactory.

Brighton County Borough Mental Hospital, Haywards Heath, supports 820 cases. Parole has been introduced and four of the female wards have open doors into the garden throughout the year. The dental surgeon has attended 435 patients during the year. Clinical rooms have been provided for three wards, and the provision of verandahs and admission wards for recent and recoverable cases is under consideration. Patients are encouraged to wear their own clothes. A large proportion of the nurses hold the M.P.A. certificate.

Kent County Mental Hospitals Service maintains two hospitals. 1750 patients, including 70 "Service" cases, are accommodated at *Barming Heath, Maidstone*. There is a recovery-rate of 39.6 per cent.; 65.7 per cent. of these taking place within a year of the onset of illness. The death-rate touched the remarkably low figure of 5.6 per cent.; post-mortem examinations were carried out in 84.8 per cent. of fatal cases. Occupational therapeutics is organised under a special officer and the patients are classed in three groups: (1) those able to work by themselves; (2) those able to work in parties; and (3) those requiring individual attention. It is hoped to develop the third class further. Many patients have been sent out on trial, several of them with a money allowance. Most of the nurses hold the M.P.A. certificate.

At *Chartham Downs (Kent Co.)* there are 1150 patients, four of whom have been in the hospital since its opening in 1875. Benefit has been obtained in cases of general paralysis by the malarial treatment. As in so many mental hospitals, there is a large number of senile cases which could more happily be nursed in infirmary wards. There have been mild epidemics of influenza and dysentery. The death-rate is 7 per cent. and the recovery-rate 30.7 per cent. Two new blocks for male patients are in course of construction. Many patients have been allowed out on trial, short leave, and parole, although these privileges have not yet been granted extensively on the female side.

The *City of Birmingham* maintains two institutions: *Winson Green* and *Rubery Hill and Hollymoor*, accommodating some 2500 patients. At the former there has been a recovery-rate of 45 per cent. on the direct admissions. The majority of these cases had a stay of from 4 to 12 months in hospital. The death-rate was 8.38 per cent., a drop from the previous year, and the lowest since 1861; post-mortem examinations were made in 79 per cent. The general health has been good except for an epidemic of influenza. Six cases of general paralysis have been treated by malarial injection with resulting improvement, but no complete recovery so far. Some 70 per cent. of the patients are kept occupied about the grounds, workshops, and wards, and there is ample provision of entertainments and sports. Parole and short leave have been exten-

sively granted. At *Rubery Hill* the death-rate has been 6.78 and the recovery-rate 48.6 per cent., with a further 15.8 per cent. "relieved." Special attention has been paid to the discovery and elimination of chronic septic foci, and a staff of consultants and specialists has been gathered as well as a radiographic equipment. The figures given suggest that this method of approach is of the greatest value. The hospital is approved as a training school for mental nurses. The Birmingham hospitals are fortunate in the help they can obtain from the excellently equipped laboratories under the honorary directorship of Sir Frederick Mott.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment. §
Bootle ..	12,297	11,126	3778	10,812	31.7
Margate ..	3,255	2,910	1074	847	12.0
Macclesfield ..	4,441	—*	1281	784	47.5
Blackburn ..	17,522	15,110	{ 5088† 1284‡ }	5,450	24.1
Wigan ..	13,575	11,035	3750	7,060	24.0

—* Not given. † Routine. ‡ Fourteen-year-old group.
§ Excluding dental defects and uncleanness.

Bootle.

THIS report presents a number of features calling for comment. In it is given the actual cost of medical inspection, which is in Bootle 4s. 7½d. gross and 2s. 3½d. net for every child on the school roll. The rate-payers can see that this figure is reasonable considering the district, and compares well with the rest of the country. The work of past years is shown in a table enumerating routine and special examinations from the year 1908 up to the present date; the total of inspections in 1908 was 1565, against 15,048 in 1924. The next paragraph shows some of the results obtained—e.g., malnutrition has fallen from 14.3 to 5.9 per cent. and enlarged tonsils from 11.2 to 7.6 per cent. The number of barefooted children is put down at 2.7 per cent.—they may be better off than others with badly fitting and defective footwear. Bootle is fortunate in having clubs which distribute clogs to suitable and deserving cases.

It was not found necessary to close any school or department for infectious disease during the year. The town is abreast of the times in having zinc ionisation at its aural clinics, a method which seems likely to repay its cost to the community—cutting short cases of otorrhoea which would otherwise proceed to deafness and other grave complications. The treatment is carried out by passing an electric current of 3 milliamps. for ten minutes through the ionising fluid (5 gr. of zinc sulphate to 1000 c.cm. of water) contained in the external ear channel. Dr. F. T. H. Wood considers that in cases of double otorrhoea it is better to restrict ionisation to one ear at a time, while the other ear receives cleansing treatment. There are no special schools in Bootle. Arrangements for the treatment of crippling defects include the provision of special hospital beds and the conduct of a remedial exercises clinic. This clinic is staffed by a qualified masseur and his assistant and is supervised by the school medical officer with the coöperation of a consulting orthopaedic surgeon. The payment by parents for treatment amounted only to £56 7s., of which £39 19s. represented payment for dental treatment.

Margate.

Intimate coördination is maintained between the various health services, as Dr. Rowan McCombe himself carries on the duties of school medical officer, medical officer of health, and medical adviser to the

infant welfare centre. Commenting on the 75 per cent. reduction in the numbers of unclean children during the past few years, Dr. McCombe draws attention to the increasing practice at some schools, especially among the girls, of wearing a simple tunic uniform—an excellent practice which makes for tidiness and cleanliness and inspires the wish to “live up to the uniform.” Goitre is of rare occurrence; only one case, with mild enlargement, was seen in the district. Fifty-eight operations for tonsils and adenoids took place at the school clinic, the children being kept at the clinic for one night following the operation and seen the following morning by the surgeon and again inspected in a week’s time. Adequate arrangements are made for the treatment of mentally defective children and deaf-mutes, and severe cases of epilepsy, and a strong plea is put forward for an open-air school to ensure treatment for the anæmic and pre-tuberculous children.

Macclesfield.

The school medical officer, Dr. J. Hedley Marsh, who is also medical officer of health, issues a brief report, much of which is only of local interest. Tonsils and adenoids seem to receive thorough treatment and after operation are carefully followed up, while the parents are advised to see that the children carry out the after-treatment which is clearly described on printed cards. Visual defects rarely fail to secure treatment and dental inspection is well carried out, nearly 90 per cent. of all the children in the schools being inspected by one of the three dentists. Dr. Marsh records, however, that only 31 per cent. of those requiring treatment receive it, and this, as he says, is not satisfactory. There are no special schools in the area, and Dr. Marsh stresses the necessity for a mentally defective school and hopes that one may be established. An orthopædic clinic is carried on at the general hospital and good work is evidently done at the general school clinic.

Blackburn.

Dr. W. Allen Daley reports progress in organisation during the past five years. An additional age-group has been included—viz., the “leaver” or 14-year-old group. Almost all the clinics began within this period and lately there has been added an orthopædic clinic for early treatment. He regrets the delay that occurs in dealing with adenoids, owing to lack of accommodation. Dr. Ella Mackenzie found that of the children who should have been wearing glasses only 75 per cent. were doing so. Taking into consideration the large proportion of spectacles worn which are no longer efficient, the need for some kind of spectacle “roll call” is evident. Since the hearing of every child of 8 years has been tested by the “forced whisper” the percentage of minor defects of hearing has risen from 0.4 to 1.5 per cent. Dr. Daley hopes for an increase in the clinics and for further accommodation in the open-air school and classes, and regrets there is still no physically defective school. On the other hand, there is a good mentally defective school, and a return by the late headmistress, Miss Clayton, deals with 140 scholars since 1910 who can be traced. Of these 106, or 75 per cent., are in work. This figure shows how much such a school can do when run with zeal and ability.

Wigan.

Dr. H. Whitehead’s report is a concise statement of facts with little comment, but obviously the school medical work is handicapped by inadequacy of staff. The numbers examined in the code groups are incomplete—the same lacunae have stood in the way of a thorough control of measles. Since only one half-day a week has been available for refraction, about one-third only of the cases receive prompt attention. Dental work, too, was similarly limited, but recently the dental sessions have been increased. There is a lack of special schools of all types; a few mentally defective children are attending classes for the dull and backward, but the accommodation is inadequate and such classes have not the power of salvage that

belongs to good special schools. A school camp was held with beneficial results, but this is a poor substitute for a permanent open-air school. There appears to be none of the special methods of dealing with cripples by which so many children are cured or made self-supporting in other areas. Good co-operation is maintained between the various branches of the medical services, and records from the welfare centres are available in the schools.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 8TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 63; scarlet fever, 1250; diphtheria, 691; enteric fever, 85; pneumonia, 415; puerperal fever, 37; cerebro-spinal fever, 3; acute poliomyelitis, 7; encephalitis lethargica, 41; continued fever, 1; dysentery, 3; ophthalmia neonatorum, 110. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 4 deaths from enteric fever, 22 from measles, 8 from scarlet fever, 28 from whooping-cough, 18 from influenza, and 20 from diphtheria. There were 108 deaths of children under 2 years from diarrhoea and enteritis, as compared with 101, 64, 50, 44, and 29 in the preceding weeks. In London itself there were 8 deaths from diphtheria, 3 from whooping-cough, and 6 from influenza.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

J. S. Elliot is re-entered as Surg. Lt. Comdr. with seniority of Sept. 29th, 1922.

Surg. Lt. Comdr. P. W. Carruthers is placed on the Retd. List.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lts. to be Surg. Lts.: D. R. F. Bertram and R. Wear.

ROYAL ARMY MEDICAL CORPS.

Maj. J. C. G. Carmichael retires on ret. pay and is granted the rank of Lt.-Col.

The undermentioned Capt. to be Maj.: E. W. Wade, W. K. Morrison, E. Percival (Prov.), and H. C. D. Rankin (Prov.).

ARMY RESERVE OF OFFICERS.

Capt. A. Robertson, late R.A.M.C. Spec. Res., to be Lt.

Capt. G. C. F. Roe, late temp. Capt., R.A.M.C., to be Lt.

TERRITORIAL ARMY.

Capt. A. E. L. Devonald, having attained the age limit, is retired and retains his rank.

Capt. C. A. R. McCay (late R.A.M.C.) to be Lt. and relinquishes the rank of Capt.

Lt. C. M. Bradley (late R.A.M.C.) to be Lt.

E. W. Ashworth to be Lt.

ROYAL AIR FORCE.

Flying Officer F. K. Wilson is promoted to the rank of Flight Lt.

INDIA AND THE INDIAN MEDICAL SERVICE.

The following are granted leave: Lt. F. W. Mathews, Civil Surgeon, Ghazipur; Maj. H. P. Cook, Civil Surgeon, Allahabad; Lt.-Col. F. W. Sumner, Civil Surgeon, Simla (East); Maj. T. C. Boyd, Chemical Examiner, Bengal, and Professor of Chemistry, Medical College, Calcutta; Capt. R. H. Malone, Acting Director, Bombay Bacteriological Laboratory; Major R. Knowles, Professor of Protozoology, School of Tropical Medicine and Hygiene, Calcutta; Lt.-Col. Macmillan, Civil Surgeon, Simla; Lt.-Col. A. W. Overbeck-Wright, Superintendent, Lunatic Asylum, Agra; Lt.-Colonel G. Hutchinson, officiating Inspector-General of Civil Hospitals, United Provinces; Col. A. W. R. Cochrane; Lt.-Col. I. M. Macrae, Lucknow; Lt.-Col. R. F. Baird; Maj. P. B. Mills, Civil Surgeon, Bahraich; Lt.-Col. W. S. Willmore, Civil Surgeon, Cawnpore; and Lt.-Col. T. W. Harley.

NEW MEDICAL COLLEGES IN INDIA.

The King Edward Hospital and the Govdhandas Sunderdas Medical College, fully equipped institutions established by the Bombay Municipality, were opened in July. The Medical College is the first unofficial medical institution in Bombay city and had been recognised by the University of Bombay. Last month also saw the opening of the Prince of Wales’s Medical College at Patna and the laying of the foundation-stone of the Wadia Maternity Hospital in Bombay.

Correspondence.

"Audi alteram partem."

FAMILIAL ABDOMINAL LESIONS.

To the Editor of THE LANCET.

SIR,—The interesting article by Mr. G. P. B. Huddy in your issue of August 8th raises once more the question of the relative importance of heredity and environment in these conditions, and whilst it might seem that Mr. Huddy favours the heredity hypothesis, a closer examination of his paper makes it clear that this is not the case. A family history of "indigestion" is by itself too nebulous to allow of any accurate deduction being made; extensive family histories of duodenal ulcer or gall-stones, such as are quoted, are very striking, though it is a little surprising if only two examples of such convincing histories occurred amidst 300 patients.

The following example recently came to my notice. The father had a gangrenous appendicitis in 1900 and a perforated duodenal ulcer in 1922. Of his three sons, the eldest had acute appendicitis in 1917, the second a gangrenous appendicitis in 1919, and the third a gangrenous appendicitis in 1914. It is dangerous to assume an hereditary factor from such data; the patients referred to have long been known to me as voracious eaters, but whether this is hereditary or environmental I would hesitate to say. Further, I know that for many years they were attended by an unqualified dentist whose technique was neither orthodox nor desirable.

One can imagine the difficulties of an Eastern physician when asked to write upon a "family history" of salpingitis in the harem of his ruler. On the whole the infective theory remains tenable.

I am, Sir, yours faithfully,

London, W., August 12th, 1925. T. IZOD BENNETT.

To the Editor of THE LANCET.

SIR,—Two years ago, when Mr. James Sherren delivered a lecture in Dublin on Gastric Ulcers, he drew attention to the fact that these ulcers might run in families. I was very interested, as at that time my father had under his care a case of gastritis whose father had died six months previously from gastric carcinoma. I investigated their family history, and now that attention has been drawn to this point in your journal, I think the facts of interest.

The grandfather of the present patient suffered from constipation and dyspepsia. He had to walk about during his meals "to bring up wind." He died from what was diagnosed as "perforation of the intestine." In appearance he was tall, thin, and pale. He neither smoked nor drank. Of his children one showed no signs of gastric symptoms and was unmarried. The second had occasional indigestion, and died from pneumonia. The third had a typical duodenal ulcer, the clinical signs being confirmed by X ray examination. He refused an operation. His only child was healthy. The fourth, the father of the patient, died from cancer of the pylorus, and the patient, aged 21, suffers from agonising pains about one hour after food, with acid eructations. He has never vomited, and refuses to be X rayed. His sister and brother are quite healthy. The remaining two children were daughters, one of whom living abroad suffers from "indigestion, particularly after potatoes," and her eldest child, aged 15, has frequent gastric attacks. The last child when 21 suffered from a typical acute gastric ulcer, and has done so at intervals throughout life. Her eldest child when 21 developed symptoms of duodenal ulcer, with attacks that recur each Christmas. He also refuses X ray examination. Her second child at about the same age commenced to suffer from indigestion, but on rigorous dieting these attacks pass off. They have all lived normal healthy, hygienic lives, are of good physique, and the

present generation possess perfect teeth, and, with one exception, are practically non-smokers and non-drinkers.

I am, Sir, yours faithfully,

SYLVIA B. WIGODER, M.A., M.B., T.C.D.

Dublin, August 17th, 1925.

SUBCUTANEOUS INJECTION OF COLLOIDAL SULPHUR IN NEURITIS.

To the Editor of THE LANCET.

SIR,—I will be much obliged to you if you will do me the honour of publishing the following questions as regards Wagner-Jauregg treatment of dementia paralytica. So far as my personal knowledge goes, I believe that the therapy is still empiric; I have not yet come across any scientific explanation. I assume there is nothing specific in the organism of tertian malaria, the remissions obtained, whether complete or incomplete, being in all probability due simply to the changes of the body temperature. I have obtained encouraging results in certain forms of chronic neuritis with the intramuscular injections of colloidal sulphur (sulfoidol Robin). Symptoms imitating malarial rigor followed. No new infection is introduced to call for quinine—for example, to mitigate the effects of an inoculation. The proceeding, I think, may be used as an argument to prove or disprove the specificity of the tertian plasmodium in the method of treatment, though I believe no such property is claimed.

I am sorry I have not yet met any case of dementia paralytica through eight years practice of the profession. This may be due to the fact that malaria is endemic in this country and syphilis comparatively rare. I shall be very grateful to any member of the medical profession who will test the use in appropriate cases of colloidal sulphur in this way, and will communicate the results through the pages of THE LANCET.

I am, Sir, yours faithfully,

Palestine, July 23rd. DJAMIL F. TUTUNJI, M.D.

THE ÆTIOLOGY OF CANCER.

To the Editor of THE LANCET.

SIR,—The reminder by Sir Charles Ballance of the views held by the late Mr. Shattock, than whom there was no one more conversant with the clinical as well as the pathological knowledge of cancer, brings into prominence the conviction of the clinician, that tubercle, a known parasitic disease, sarcoma and carcinoma in their modes of onset, in their course, in their termination, and in their curability are more or less alike. It took 40 years to discover the tubercle bacillus after tuberculosis was pronounced to be of this class, and for over 30 years the hunt for the parasite of sarcoma and carcinoma has been going on and has not yet been actually successfully finished. Indeed, there are signs that the hunt may once again be side-tracked. While the clinician has no difficulty in recognising cancer as a member of the great group of parasitic diseases, the pathologist has ever found a stumbling-block since the great advances in histological discoveries during the nineteenth century. Tubercle originates in connective tissue, so does sarcoma, but cancer begins in an epithelial covering. The parasite in tubercle makes a tubercle nodule and when that is completed it starts another, and each nodule is made for and by the parasite. The proliferation of cells is started by the parasite and food in abundance is produced by them. In carcinoma, a parasite—let it be assumed—locates itself in an epithelial cell, makes it reproduce itself and elaborate food—a special food for the parasite. The parasite by its vigour stimulates growth and the new cells thus formed make for it all it needs for propagating itself and for increasing its vigour and strength. In all subsequent growths in other parts of the body epithelial cells like those of the original growth appear. The unsolved problem is how that happens. Does the

parasite carry with it an epithelial cell or a derivative which is equivalent in reproductive powers to a full-grown cell, or has the parasite power, wherever it locates itself, to induce a connective-tissue cell to become transformed into an epithelial cell, the only kind it is associated with and the only one that is capable of elaborating its special food?

The former view has held its ground for many years and the lymph and blood circulation mechanism has been considered a sufficient cause for the spread of the new growth into distant parts of the body. Often that explanation is very inadequate, and surely very untrustworthy. A parasite, like every other living thing, seeks its food, and one of the bacterial groups obtains it by creating activity in cells around and by making them elaborate what it wants. It then often kills its host by exhausting the supply of nutriment or by locating itself, perhaps accidentally, in a vital part. To attain its purpose effectively the parasite of cancer should possess the power of converting a cell of the connective tissue into an epithelial one, the only form capable of elaborating suitable food for the special parasite of cancer. Biologists may know of instances in which cells, under appropriate stimuli, become converted into other and distinct forms with different functional properties. In pathology there is not, to my knowledge, an evident example.

I am, Sir, yours faithfully,

Cambridge, August 15th, 1925. JOSEPH GRIFFITHS.

To the Editor of THE LANCET.

SIR,—The letter of Sir Charles Ballance in to-day's issue of THE LANCET calls for a reply on my part.

The late Prof. Shattock was almost alone among well-known pathologists in adhering to the parasitic theory of cancer. Apart from him, pathologists in this and in other countries have been almost unanimous in rejecting the theory on the grounds that it is incompatible with the phenomena of cancer. The supporters of the theory have been almost entirely bacteriologists and clinicians, and they have never taken the trouble to meet the objections which have been brought against it by pathologists.

Prof. Shattock did not have before him the evidence that it is possible to induce cancer at will without taking the supposed parasite into consideration nor, until his later years, was he aware that it is possible to cultivate tissue cells in vitro.

The cancer germ cannot be present in the irritant used to produce cancer since this has frequently been submitted to temperatures of 300° C. or over and is thus not comparable with the tuberculous dust to which Sir Charles Ballance refers. If the parasitic theory is true the germ must therefore, as I have said, be present either in all animals or in the atmosphere. The former alternative is negated by Dr. Gye's facts, since, if it were true, it should be possible to produce cancer by his "specific factor" alone, which is not the case. We are thus left with the conclusion that this intracellular germ is universally diffused in the atmosphere! Can any of those who support the theory suggest any other alternative?

I am, Sir, yours faithfully,

Manchester, August 15th. CHARLES POWELL WHITE.

To the Editor of THE LANCET.

SIR,—The work of Dr. A. S. Leyton and Dr. Helen G. Leyton on the streptothrix in sarcomata, to which Dr. W. M. Crofton aptly refers to your issue of August 8th, was amplified later (1917) thus: Prof. Leyton kindly showed me his microscopic preparations of the organism, and I found the appearances tallied with those I had been finding within the nuclei and cytoplasm of the blood cells in cancer subjects at the Leeds General Infirmary. When I then showed him my preparations it was arranged that he would make blood cultures by his customary technique on the next case in which I should find these structures in abundance. This was successfully carried out, and the cultures obtained agreed in type with those he had already secured from tumour filtrates.

The views in Dr. James Young's letter, so ably stated, can be quite endorsed by my own experiences since the above (and since the reference in "Medical Annual," 1921, pp. 63, 64). The fact, too, that Rickettsia bodies are so widely distributed within the bodies of invertebrate animals seems to show that they may form an essential feature of bacterial life-cycles.

The difficulty which has arisen about the "law of fixity of form" is not insoluble. It comes from supposing that all life-forms must obey it. On the other hand, it does not follow that the lowest forms which are to be found within the body of a higher organism are "normal components of the body," to use the words of THE LANCET (July 25th, p. 183). The body or cell may be providing the necessary substrate (during a varying period of time) for a separate life-cycle. This possibility, and the fact that there are ultra-microscopic phases of life, was stated as long ago as 1878 by L. S. Beale in "Microscope in Medicine" (p. 317, &c.), and he pointed out that they can withstand a temperature of 148° C. The place to which he was disposed to assign these minute bodies in the scale of life is that which they seem likely to receive now.

If the prevailing, and materially favoured, school of thought of to-day is now prepared to entertain Béchamp (THE LANCET, *ibid.*), surely other concessions will follow. For instance, after all, Bastian's work on heterogenesis was not all an incorrect observation. The diverse aspects of life seen by different observers are capable of harmonisation.

I am, Sir, yours faithfully,

Hartley, Longfield, Kent, August 10th. O. C. GRUNER.

DISABLEMENT FROM CHRONIC RHEUMATISM.

To the Editor of THE LANCET.

SIR,—As one of the signatories of the letter which appeared in THE LANCET under the above heading in your issue of July 11th, I have read with much pleasure Dr. Mennell's communication of August 1st.

I am entirely in accordance with Dr. Mennell's views. In the second paragraph of his letter he lays stress on the importance of increasing the fluid intake of patients who are suffering from the non-articular forms of rheumatism. This I can fully bear out as a result of my experience when practising at Harrogate. In such cases one or other of the mineral waters are prescribed practically as a routine, and I have been repeatedly struck with the improvement which quickly takes place following the increased ingestion of liquid. The reason for this is not far to seek if we can regard these non-articular forms of the condition as being due to changes in the plasma whereby the products of muscular activity are inefficiently removed or, in other words, due to an inhibition of the metabolic exchange which results from muscular action. The absorption of comparatively large quantities of fluid which is isotonic with the blood must of necessity greatly assist the removal of waste products.

I think there can be no question that endocrine disturbance plays a greater part in the production of arthritic changes than is generally realised. Attention has been repeatedly directed by many observers to the probable inter-relationship between alterations of the thyroid and arthritic affections. After all the "make up" of an individual is largely dependent on the harmonious action of his endocrine system. The variation in the train of symptoms in different people which arise from the same stimulus is quite explicable on these lines. Broadly speaking, we can classify groups of cases according to their reaction and for these groups we can revive the old name of "diathesis." We should thus define "diathesis" as a disease tendency depending on an altered blood admixture. From this point of view we are quite justified in speaking of an arthritic diathesis. Such a diathesis shows certain more or less well-defined types. We have the young nervous female with tachycardia, sweating, pigmentation, and various trophic changes

with general metabolic upset who tends to develop symmetrical joint changes beginning in the smaller joints. Then we have the stout, well-nourished woman who about the time of the menopause begins to have coarse synovial changes in the hips or knees. These changes are accompanied by all the signs of mild thyroid deficiency. We have also the pale, anæmic, sweating child with a dicrotic pulse, tachycardia, arrhythmia, and a tendency to dilatation of the right ventricle. Such a child is particularly liable to attacks of pyrexia with pain and stiffness of the joints and the formation of fibrous nodules.

Space does not permit a detailed consideration of the rôle played by infective foci in the production of what we term "rheumatic disease." So far as my own experience goes I should certainly say a great deal depends on whether the "exudate" or pus from the focus is under pressure. Pus exuding from a tooth socket is not nearly so likely to cause trouble as a locked-up apical infection. The most dramatic recovery I ever saw followed the removal of an old inflamed appendix from a man who for years had never been free from attacks of arthritis affecting practically all his joints in turn. After his operation he never had the slightest sign of any joint trouble.

As stated in the concluding paragraph, it certainly is a fact that all cases of so-called rheumatism are not what they seem. In this connexion I would say that one should never diagnose a non-articular case as "rheumatic" until every other possibility has been excluded. A very large number of such cases are really due to definite injury with possibly a certain amount of subluxation. This is a veritable pitfall for the unwary, and if after a course of soothing lotions, liniments, and medicine the case falls into the hands of a bonesetter, who, recognising the condition, corrects the deformity by forcible extension and manipulation, and effects a speedy cure, the regular practitioner is apt to feel that "his eye has been badly wiped." The retention of the term "rheumatic" as a description of an ill-defined group of diseases which only agree among themselves in having no connexion with that acute and subacute infection we call rheumatic fever, requires a certain amount of justification. We can only justify it by saying that when we speak of rheumatic disease we know what we mean and that we are referring to a group of conditions whose ætiology has not been thoroughly worked out. With the advance of our knowledge the term will come to be used less and less frequently and finally only applied where it should really belong—viz., to the acute and subacute infections.

I am, Sir, yours faithfully,

MATTHEW B. RAY.

Bentinck-street, W., August 17th, 1925.

INDISCRIMINATE SALE OF POISONS.

To the Editor of THE LANCET.

SIR,—There is no record of achievement of which we as a nation have more reason to be proud than our organisation of public health, but there is at least one black patch which ought to give rise to very different feelings.

Scarcely a day passes without its tale of suicide, and in too many cases the cause of death has been found to be the taking of poison. It is not the primary poisons that are guilty (their restriction has served its purpose well) but the ordinary "household" poisons, of which spirits of salt is the chief. This can be sold by any shopkeeper as long as it is contained in a poison bottle and labelled "poisonous," and bears the name and address of the seller. These restrictions are not enforced and are consequently disregarded every day.

This indiscriminate sale of poisons, for which there must be substitutes for household use, constitutes a grave public danger, and calls for the action of the authorities in enforcing the law as it stands or restriction of the sale with the utmost stringency.

I am, Sir, yours faithfully,

House of Commons, August 12th. J. H. WILLIAMS.

THE SUPPLY OF VACCINES TO PANEL PATIENTS.

To the Editor of THE LANCET.

SIR,—As a warning to other panel doctors, I submit my experience of trying to obtain repayment from the Middlesex Insurance Committee of the cost of a vaccine used for a panel patient.

In January last I sent the receipted pathologist's bill to the Committee with a request for repayment. Repeated applications failing to obtain the courtesy of a reply, I recently instructed my solicitors to take proceedings. Their first letter was ignored, but the threat of a writ seems to have stirred the official mind from its hebetude, and I have now, after seven months, received a cheque, without comment or explanation given. I understand from my solicitors that, in point of fact, there would be some legal doubt on whom a writ could be served in such a case.

I am not encouraged to repeat the experiment of using vaccines for panel patients, so long as the present system is in force of making the panel doctor pay the cost himself, in the first place, and getting a refund later, if he can, from the Insurance Committee.

Why cannot the pathologist's account be met by the Committee direct?

I am, Sir, yours faithfully,

C. WILLETT CUNNINGTON.

Dollis-avenue, Finchley, N., August 18th, 1925.

Obituary.

WALTER CARLESS SWAYNE, M.D., B.S. LOND.,
M.D., CH.B. BRISTOL.

PROFESSOR OF OBSTETRICS IN THE UNIVERSITY OF BRISTOL;
CONSULTING OBSTETRICIAN AND GYNECOLOGIST TO
THE BRISTOL ROYAL INFIRMARY.

THE sudden death of Walter Carless Swayne occurred on August 8th at the age of 63, under particularly painful circumstances, at Sellack, near Hereford, at the residence of his son-in-law, Mr. R. D. Wreford-Brown. It appears that Dr. Swayne and his son had joined the family of his daughter and son-in-law, and that about 1 o'clock in the morning Mr. Wreford-Brown, who was gassed at Cambrai when in the Welsh Guards, became suddenly demented. He roused the sleeping household by firing a revolver out of his wife's bedroom window under the delusion that the house was gassed, and then entered his father-in-law's bedroom and shot him in the abdomen. Dr. Swayne's son, groping in the darkness, disarmed the assailant, but Dr. Swayne died a few hours later. He was in the full activity of practice as the leading consulting obstetric surgeon in Bristol and the West of England, and this tragic end to his career has caused profound sorrow to the whole neighbourhood, and especially to his colleagues and patients by all of whom he was greatly esteemed.

Walter Carless Swayne, the eldest son of Mr. R. A. Swayne, of Tillington Court, Hereford, one of a family of seven sons and seven daughters, was born at Mathon, near Malvern, in 1862. He was educated at King Edward's School, Birmingham, and began his professional life by entering the Bristol University College and attending the General Hospital. He at Bristol resided with his well-known uncle, Dr. Joseph Griffiths Swayne, till in 1886 he went up to Guy's Hospital for the completion of his clinical work. After taking the double qualification of the Colleges and graduating M.B. at the University of London with honours in forensic medicine, he became resident obstetric physician under Dr. Galabin and Dr. P. Horrocks. In 1891 Swayne was appointed obstetric physician at the Bristol Royal Infirmary with the charge of six beds and an out-patient clinic. He threw himself into the work and organisation of this depart-

ment with the zeal that characterised everything that he set his hands to. As time went on he so developed the restricted department till he at length evolved one of the most highly equipped obstetric and gynaecological clinics in the United Kingdom, with separate wards for lying-in cases and gynaecological operations, an extensive extern lying-in department, a large out-patient clinic, and an antenatal clinic.

He took the M.D. degree in 1894 and in the meanwhile he had been appointed Professor of Obstetrics at the University College, and was continued in this post when the University was incorporated in 1909, becoming the first professor in the chair of Obstetric Medicine. As a teacher he attracted a large following and enjoyed a high reputation as a consultant. He took the ad eundem degrees of M.D., Ch.B., and was enthusiastic in fostering a corporate spirit and in upholding the rights of graduates in Convocation, and furthermore was conspicuous in the movement to form an active graduates' association. It was largely due to his initiative that the M.Ch. is granted in obstetrics at Bristol and nothing proves more strikingly his originality than the plan of making an operation by candidates for the Mastership a part of the test for the highest degree conferred in the specialty. Without being a prolific writer he made many valuable contributions to the Bristol Medico-Chirurgical Society's Transactions and to other scientific journals. He contributed also to Latham and English's "System of Treatment," while he edited the eleventh edition of his uncle, Joseph Griffith Swayne's, well-known "Obstetrical Aphorisms." He undertook this task in response to requests so numerous as to make it clear that there was still a place which the re-issue of this popular little work could fill with advantage, and he accomplished the revision successfully, retaining the original form of the work, while rendering it valuable to modern students.

As Major Swayne, R.F.A. (T.), he will be well remembered by a very large number of those serving in the late war. When he first went to Bristol he joined the Bristol Volunteer Artillery Corps; he was nick-named "Bombardier Dick" in recognition of his military enthusiasm, and induced many other students and friends to join, and for his 20 years' steady service he was awarded the V.D. On the outbreak of war in 1914 he had much to do with the initiation of the Bristol University O.T.C., of which he was placed in command. He then threw up all professional ties and became a soldier. He raised the third line of the South Midland R.F.A., proceeding later to the camp at Churn and at Bulford. As an administrative officer he was conspicuously successful; never flinching from the hardships which he had cheerfully undertaken, he was beloved by the men under him. The refusal by the War Office to send him on service abroad was a great disappointment to him, but his none too robust health and his age made the decision reasonable and the work which he rendered at home was admirable. Towards the close of his administrative career he was appointed to the command of a battery of the New Zealand Artillery on Salisbury Plain, which he conducted overseas to France. Five years of military work away from home was a strain which told heavily but never lessened his enthusiastic activities when at the end of the war he resumed his work as professor of obstetrics and his charge of the department at the Royal Infirmary. In recognition of his self-sacrificing devotion to the military service of the country the committee of the Bristol Royal Infirmary extended the tenure of his post at the Royal Infirmary beyond the usual age-limit.

His athletic achievements in youth were considerable and he played for Guy's Hospital at Rugby football and was in the hospital rowing four. Fishing was his hobby in later years, and he was an expert with the dry fly and well known on the Monnow. He was Past Master of St. Vincent's Lodge, and had held office in the higher orders of Masonry. In 1894 he married Louisa Margaret, daughter of the late Rev. R. F. Heath, by whom he had three daughters and a

son. A devoted Churchman, a loyal colleague, and ever a sympathetic friend in trouble alike to rich and poor, the death of Walter Swayne is deeply regretted by the medical profession; for his widow and children we sympathise profoundly in their grievous loss.

CHARLES LLOYD TUCKEY, M.D. ABERD.

Dr. Charles Lloyd Tuckey, who died at his house in Eastbourne on August 12th aged 70, had retired from practice and had been in poor health for the past 12 years, but continued to the end his interest in psychotherapy and in psychical research for which he was well known. His father, a medical graduate of Trinity College, Dublin, practised at Canterbury, and Lloyd Tuckey was educated at the King's School and later at King's College, London, and at the University of Aberdeen, whence he graduated M.B., C.M. in 1875, taking the M.D. in 1884. Early attracted to treatment by suggestion he studied hypnotism in 1888 under Liebault at Nancy, and may be regarded as the pioneer of hypnotic therapy in England, being closely followed by the late Dr. Milne Bramwell. Lloyd Tuckey started this work in London in 1878, and at his consulting-rooms in Green-street and Upper Brook-street, W., demonstrated his methods to medical men freely. His success in treatment was helped by his personality, for he was a man of great kindness, wide culture and literary ability, handsome presence, and sympathetic manner. He was a frequent contributor on his subjects to the medical journals and literary reviews, articles from his pen appearing in *THE LANCET*, *Brain*, *Practitioner*, and the *Nineteenth Century*, while his book, "Treatment by Hypnotism and Suggestion," now in the seventh edition, brought him international recognition. As the cases in this book show, he was frequently successful in the treatment of alcoholism. He was one of the founders of the Society for Psychical Research, and was for many years a member of the council of that body, of which he was afterwards elected an honorary member. His retirement from practice took place at a time when the present psychotherapeutic measures were coming before the profession, and though interested in the developments he was chary of expressing an opinion as to their remedial values after the opportunities of personal clinical trial had gone from him.

Late in life he married Beatrice Mary, daughter of the late Robert Wood Marsland, a London solicitor, who nursed him with devotion during his long illness.

DONATIONS AND BEQUESTS.—The late Mr. Walter Thomas Fremlin, of Milgate Park, Maidstone, left by will £1000 to St. Thomas's Hospital, £500 to the East Kent General Hospital, Maidstone, and £500 to the Kent County Ophthalmic Hospital.—Mr. John Douglas Oliver, of Morpeth, bequeathed £3000 to the Morpeth Cottage Hospital and District Nursing Association.—Colonel John Chadwick Barlow, M.V.O., J.P., of Bury and Darley Dale, Yorkshire, a director of the Bleachers' Association, Ltd., left the residue of his property, amounting to nearly £200,000, to be applied within 21 years of his decease for such charitable purposes within the United Kingdom of Great Britain and Ireland, India, or any British State, Colony, or Dependency as his executors in their absolute discretion should think fit, stating "my desire being that the same shall not be utilised for sectarian or party political purposes, and that they shall have regard to such charitable purposes as I have been interested during my lifetime."—The £600 damages recently awarded to them in the High Court for libel and slander has been awarded by Messrs. J. Lyons and Co., Ltd., to the following charities: the London Hospital £200, Paddington Green Children's Hospital £200, West London Hospital £150, and £50 to the Parent Hospitals of Shropshire and the Border Counties.—On "Alexandra Day" in Liverpool the total sum realised on June 20th was £5676, and of this sum the Liverpool Child Welfare Association received £1596, the Royal Liverpool Children's Hospital £1111, and the Royal Liverpool Children's Hospital, Heswall Branch, £489.—Mrs. Ada Ellen Robertson, of Kensington, W., who left £15,620, apart from a small annuity, practically gave all other of her property to the Hospital for Sick Children, Great Ormond-street.

Medical News.

POST-GRADUATE COURSES IN TUBERCULOSIS.—The following courses have been arranged by the Joint Tuberculosis Council: (1) A fortnight's course in the pathology and bacteriology of tuberculosis, conducted by Dr. Roodhouse Gloyne at the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, from Monday, Sept. 21st, to Saturday, Oct. 3rd. The class will meet in the mornings or in the afternoons according to arrangement. Class limited to six members. (2) A course in non-pulmonary tuberculosis beginning Monday, Sept. 28th, ending Saturday, Oct. 3rd. Monday, Sept. 28th, at Heatherwood Hospital, Ascot (charabancs from and to London arranged). Tuesday, Sept. 29th, at Queen Mary's Hospital, Carshalton. Wednesday, Sept. 30th: Morning, diseases of the skin department, London Hospital; afternoon, the Royal College of Surgeons, Lincoln's Inn-fields. Thursday, Oct. 1st: Morning, diseases of the skin department, London Hospital; afternoon, All Saints Hospital for Genito-Urinary Diseases. Friday, Oct. 2nd, and Saturday, Oct. 3rd, the Wingfield Orthopaedic Hospital, Oxford. The class will be limited to 30 members. Early application should be made to William Brand, acting Hon. Secretary, 19, Brunswick-square, Camberwell, S.E. 5, who will supply all further particulars.

THE SPAHLINGER TREATMENT.—Mr. Spahlinger has returned to Geneva to prepare a sufficient quantity of vaccine and serum to immunise a number of calves, as arranged with the Committee of Agriculturists and Veterinary Surgeons which has been formed at Crewe. These tests and controls are to take place in October. The animals are already being selected, and it is expected that Mr. Spahlinger will come to Crewe to make the injections. The results will be observed by a committee of agriculturists and veterinary surgeons, with whom will be associated the Agricultural Committee of the House of Commons, and a representative of the Minister of Agriculture. In the meantime the production of further supplies of vaccine and serum for human beings will be temporarily suspended.

MIDDLESEX HOSPITAL.—The recently issued report for 1924 records that owing to the closing of two wards there was a diminution of 364 in the number of in-patients admitted. Nevertheless, 5188 in-patients were treated. Their average weekly cost was £4 1s. 1d., an increase of 2s. 3d. upon the preceding year. At 38,259 there was an increase of 2440 in the total of in-patients. Grateful note is made of the steady growth of the St. Marylebone Associated Hospitals' League, with a membership of about 20,000, which yielded during the year a total of £2748. A warm tribute is paid to the services of Dr. Campbell Thompson, physician to the department of nervous diseases and lecturer in neurology, upon his resignation from the active staff after an association of 36 years as house physician, dean of the medical school, and in the department of nervous diseases. Attention is drawn to the importance of endowing the professorial chairs attached to the hospital's medical school; of these seven chairs only three have yet been endowed. The period of training for nurses and probationers has been increased from three to four years, but the question of establishing a nurses' preliminary training school has been postponed pending the provision of permanent accommodation. The report of the Cancer Charity of the hospital shows that 712 patients were admitted, an increase of 79, and that the percentage of occupied to available beds was very nearly 95 per cent. There is thus practically no bed-wastage. The rebuilding fund now exceeds £200,000.

HARROGATE ROYAL BATH HOSPITAL.—At this hospital of 150 beds, also styled the National Hospital for Rheumatic Diseases, a new laboratory was opened by Princess Mary, Viscountess Lascelles, on August 10th, when Lord Harewood, the patron, presided over a large meeting in the main hall of the hospital, and pointed out that £5500 were still required to make up the £12,000 appealed for last year. That appeal was for a centenary fund for further equipment of the hospital with adequate accommodation—e.g., for additional nursing staff, surgical, radiological, and dental departments. The new laboratory, which cost £3500, may demand an additional £1000 for equipment, towards which £500 has been subscribed by Sir Edward Brotherton, Bart., while £1000 has been presented by the hon. treasurer of the hospital, Mr. Walter Freeman, as the nucleus of an endowment fund for laboratory purposes.

After Princess Mary had declared the new laboratory open, a short address was given by Prof. Arthur Hall, in which the necessity in medicine for distant vision was emphasised, an important feature of such vision being the furnishing of adequate facilities for laboratory work. After the votes of

thanks to Her Royal Highness, Dr. G. L. Kerr Pringle, senior physician to the hospital, drew the attention of the audience to the widespread crippling caused by the group of chronic rheumatic diseases, and the justification for more determined efforts in research.

Princess Mary then inspected the new building, where various aspects of the work of the laboratory were demonstrated by Dr. Sinclair Miller and Dr. F. B. Smith, the pathologists to the hospital. Hitherto this branch of work has been carried on with very limited facilities and accommodation. The new building comprises a waiting-room, a consulting-room, four workrooms for bacteriology and chemistry, a preparation-room, and a cleansing-room, and represents the first step in materialisation of a scheme of development which should make the equipment of the hospital as adequate as that of any hospital in the kingdom. There is now at this hospital ample opportunity both for routine investigation of individual patients and for organised research into the problems involved in the ætiology and treatment of chronic arthritis and allied conditions which still remain obscure.

DEATH OF A SOUTH AFRICAN PRACTITIONER.—The death on July 19th is announced of Dr. Peter Christian de Wet, of Cradock, Cape Province, where he had practised for 34 years. He was the local medical officer of health and had been largely concerned with the establishment of the Cradock Hospital 25 years ago.

KEIGHLEY'S NEW WATER-SUPPLY.—The Marquess of Hartington on August 11th performed the inauguration ceremony of the Keighley Corporation's new Sladen Valley waterworks. The scheme was begun in 1910, and has cost £570,000. The new waterworks will add an available supply of a million gallons a day in addition to the existing 1,600,000 gallons a day from the Watersheddes reservoir. The gathering-ground of the new supply comprises an area of 1080 acres.

THE LATE DR. A. W. ATKINSON.—Arthur William Atkinson, M.B., Ch.B. Edin., died at his residence in Crewe on August 6th from pneumonia. Born in Crewe in 1881, he was the youngest son of the late Dr. James Atkinson, first mayor of Crewe. He studied at the University of Edinburgh and at Heidelberg, graduating M.B., Ch.B. Edin. in 1906, and later obtained the certificate with distinction of the London School of Tropical Medicine. He served with great credit in the Boer War, and for some time was medical officer on the West African Medical Staff on the Gold Coast. On the death of his brother, Dr. J. R. Atkinson, he gave up his Government appointment to take up practice in Crewe. A keen lover of sport, he was also a prominent Freemason. Dr. Atkinson, who leaves a widow and a daughter, was highly appreciated as a family physician.

MANCHESTER'S SEWAGE DISPOSAL.—On August 12th a Ministry of Health inquiry was held in the Manchester Town Hall into the application of the corporation to borrow £465,000 for an extension of the sewage disposal scheme. The cost of the extension will be equal to 24d. in the rates. The proposed improvements are designed to meet drainage demands for the next 50 years. Additional facilities will be provided for the disposal of sludge, which at present is taken by boat down the Ship Canal and dumped into the sea, and over 200,000 tons a year are disposed of in this way. It was stated that later it was hoped that the sludge would be so treated as to form a product for agricultural purposes.

Appointments.

MORTIS, R. H., M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon, Hertford County Hospital.

MUIR, T. J., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Pickering District (North Riding).

Vacancies.

For further information refer to the advertisement columns.

Birmingham University.—Lecturer in Bacteriology. £450.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £120.

Bootle Borough Hospital.—H.S. At rate of £125.

Brighton, New Sussex Hospital.—H.S. £50.

Bristol General Hospital.—H.P.'s, H.S., &c. Each at rate of £80.

Bristol Royal Infirmary.—Sen. Res. M.O. At rate of £200. H.P.'s, H.S.'s, &c. At rate of £80. Dental S. At rate of £116.

Canterbury, Kent and Canterbury Hospital.—Hon. S. to Ear, Nose, and Throat Dept. Also Third Res. M.O. At rate of £125.
 Devonport, Royal Albert Hospital.—H.S. £150.
 Dumfries, Crichton Royal Mental Hospital.—Asst. P. £350.
 Glamorgan County Mental Hospital, Bridgend.—Temp. Asst. M.O. At rate of £300.
 Gloucester Institution and Infirmary, Great Western-road.—M.O. £150.
 Hertford County Hospital.—H.P. At rate of £150.
 Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.
 Liverpool, Royal Southern Hospital.—Hon. Asst. P.
 Manchester, Monsall Hospital for Infectious Diseases.—Second Asst. M.O. £375.
 Manchester Royal Children's Hospital, Pendlebury.—Asst. M.O. At rate of £150. Res. Surg. O. At rate of £80.
 Manchester Royal Eye Hospital.—Jun. H.S. £120.
 Medical Society of London.—Secretary.
 Plymouth Borough.—Asst. M.O.H. £600.
 Poplar Hospital for Accidents, East India Dock-road, Poplar, E. Sen. Res. O. £200.
 Preston County Borough.—Asst. Sch. M.O. £600.
 Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.
 Royal Eye Hospital, St. George's Circus, S.E.—H.S.
 Royal Free Hospital, Gray's Inn-road, W.C.—Obstet. Asst. At rate of £100.
 Salop County Council.—Asst. M.O. £600.
 Southampton, Borough Isolation Hospital.—Res. M.O. £360.
 Staffordshire Mental Hospital, Cheddleton, Leek.—Jun. Asst. M.O. £350.
 Stockport Infirmary.—Two Res. H.S.'s. Each £175.
 Sudan Government, Wellcome Tropical Research Laboratories, Khartoum.—Asst. Bacteriologist. £E.720.
 Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of Chest.—Jun. Res. M.O. At rate of £250.
 West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each at rate of £100.
 The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments for Certifying Factory Surgeons: East Grinstead, Sussex; Petersfield, Hants; Colwyn Bay, Denbigh.

Notes, Comments, and Abstracts.

NEW REGULATIONS FOR PRESERVATIVES IN FOOD.

CERTAIN new regulations under the Sale of Food and Drugs Acts have been laid down and circulated to town clerks, clerks to councils, and port sanitary authorities, based on the recommendations of the Departmental Committee on the Use of Preservatives and Colouring Matters in Food. The Regulations provide for the prohibition of the importation and sale of articles of food to which preservatives and other specified substances have been added, and in particular an important section deals with food importations. The enforcement of the edict with respect to meat and fish is to be left to the local authorities, who are not precluded from taking action with regard to other articles, though care has been taken in the Regulations to avoid any duplication of jurisdiction as between them and officers of Customs and Excise.

One of the recommendations of the Departmental Committee was, that any prohibitions or limitations imposed by Regulations should bind the courts in proceedings taken under the Sale of Food and Drugs Acts. In this way the Committee went on to say: "Traders and the public generally would know what was permissible and what was not, and there would be no conflict of expert evidence on the question whether the amount of preservative or colouring matter was or was not injurious to health. The only point at issue would normally be whether the preservative or colouring matter found in the food, or the amount of it, was in contravention of the Regulations." The Departmental Committee recommended a change in the law in this direction, and the Minister of Health is entirely in agreement with the view of the Committee, but it has not been found practicable to introduce legislation to give effect to the recommendation. The Minister commends the matter, however, to the consideration of local authorities and suggests that proceedings should not be taken under the Sale of Food and Drugs Acts in respect of the addition of preservatives to food except where such addition would be contrary to the provisions of the Regulations. "In this connexion," the Minister's communication runs, "local authorities will no doubt have regard to the fact that in conformity with the recommendation of the Committee, the Regulations have been framed so as to allow time for the adjustment of methods and processes and the clearance of existing stocks, before they come into operation."

No Regulation is made concerning the question which has arisen as to the power to give incriminated persons an opportunity to furnish explanations, the matter being left to the discretion of the local authorities. But the local authorities are reminded that they have power instead of, or in addition to, taking proceedings against a retailer, to take proceedings against the manufacturer or wholesaler by whom the article was previously sold. It is suggested that this provision might be used with advantage in many cases where an article of food is sold in a sealed container bearing the name and address of the manufacturer or of the wholesale dealer responsible for its distribution.

The Regulations come into force on Jan. 1st, 1927.

Appended are two schedules. The first enumerates (1) the articles of food which may contain preservative and the nature and proportion of the preservative in each case; and (2) the colouring matters which may not be added to articles of food. In these forbidden sophistications are found the colouring matters derived from antimony, arsenic, and other metals the use of whose salts is found perilous. It will be seen from the first part of this schedule that sulphurous acid and benzoic acid will be the only preservatives that can be employed legally after Jan. 1st, 1927, and undoubtedly the exclusion of boron will give rise to discussion. The Regulations must be welcome, for the simple reason that they will baffle the ingenuity of those who are still able to disguise the presence of putrefaction in our foodstuffs, and in this way to escape the necessity of cleanly storage and transport and careful handling; but it will be seen that considerable difficulty will arise unless new arrangements are made both in shops and households with respect to the protection of perishable material. Under this large abolition of chemical preservatives, though no one can regret the unqualified veto upon dangerous minerals and formaldehydes, there will be great difficulty during summer periods of protecting many articles of food from putrefaction, save in great establishments where cold-storage plants are in existence. As Mr. P. N. Pantan has written in the *Times* this week, "We shall have to ensure a more rapid carriage of foodstuffs, a greater cold-storage accommodation, and an installation of refrigerators in the home as widely distributed as in the United States."

Births, Marriages, and Deaths.

BIRTHS.

DE MOWBRAY.—On August 15th, at Grosvenor House, Lynton, Hants, the wife of Ralph M. de Mowbray, F.R.C.S., of a son.
 EVANS.—On August 13th, at Glanfraed, Brundall, Norwich, the wife of Dr. Henry W. Evans, of a son.
 FRASER.—On August 9th, at Garlands, Redhill, the wife of Dr. M. W. Fraser, W.A.M.S., of a daughter.
 WOOLER.—On August 8th, at St. John's House, Cleckheaton, Yorks, the wife of Dr. E. W. Nowell Wooller, of a daughter.

MARRIAGES.

CHARLES—FISHER.—On August 6th, at St. Michael and All Angels' Church, Butcombe, Somerset, John Roger Charles, M.D., F.R.C.P., to Hilda Mary Fisher.
 KITCHIN—LANDER.—On August 12th, in London, Derek Harcourt Kitchin to Mary Kathleen Forsaith Lander, M.Sc., M.B., B.S.

DEATHS.

ALEXANDER.—On August 12th, at Kingsdown-road, Epsom, Thomas Anderson Alexander, M.D., in his 67th year.
 HULKE.—On August 15th, at Admiralty House, Deal, Frederick Backhouse Hulke, J.P., M.R.C.S., L.R.C.P., aged 65 years.
 WARNER.—On August 15th, at Clacton-on-Sea, after a long illness contracted during the war, Cuthbert Warner, B.A., M.B., B.Ch., late surgeon in the Royal Navy.
 N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 24th, to SATURDAY, August 29th.—ALL SAINTS HOSPITAL, Vauxhall Bridge-road, S.W. Clinical demonstrations Wednesday evening, Thursday afternoon and evening, and Saturday afternoon. Wed., 2 P.M., Mr. J. C. Ainsworth Davis on Tuberculin in the Treatment of Urological Tuberculosis.—QUEEN MARY'S HOSPITAL, Stratford, E. Intensive Course in General Medicine, Surgery, and the Special Departments. First week as per syllabus. Morning and afternoon sessions. Fee £2 2s. for week or £3 3s. for two weeks.

The second schedule gives instructions for the labelling of articles of food containing preservatives, and also for the labelling of the preservatives themselves.

THE FIRST SCHEDULE.

PART I.—Articles of Food which may contain Preservative and Nature and Proportion of Preservative in each case.

The articles of food specified in the first column of the following table may contain the preservative specified in the second column in proportions not exceeding the number of parts (estimated by weight) per million specified in the third column :—

Food.	Preservative.	Parts per million.
1. Sausages and sausage-meat containing raw meat, cereals and condiments	Sulphur dioxide	450
2. Fruit and fruit pulp, not dried :— (a) Strawberries and raspberries	"	2000
(b) Other fruit	"	1500
3. Dried fruit :— (a) Apricots, peaches, nectarines, apples, and pears	"	2000
(b) Raisins and sultanas	"	750
4. Unfermented grape-juice and non-alcoholic wine made from such grape-juice if labelled in accordance with the rules contained in the Second Schedule to these Regulations	Benzoic acid	2000
5. Other non-alcoholic wines, cordials, and fruit juices, sweetened or unsweetened	Either sulphur dioxide or benzoic acid	350
6. Jam (including fruit jelly prepared in the way in which jam is prepared, but not including marmalade made from citrous fruits)	Sulphur dioxide	40
7. Candied peel	"	100
8. Sugar (including solid glucose)	"	70
9. Corn syrup (liquid glucose)	"	450
10. Gelatine	"	1000
11. Beer	"	70
12. Cider	"	200
13. Alcoholic wines	"	450
14. Sweetened mineral waters	Either sulphur dioxide or benzoic acid	70
15. Brewed ginger beer	"	120
16. Coffee extract	Benzoic acid	120
17. Pickles and sauces made from fruit or vegetables	"	450
	"	250

PART II.—Colouring Matters which may not be added to Articles of Food.

1. *Metallic Colouring Matters.*—Compounds of any of the following metals : Antimony, arsenic, cadmium, chromium, copper, mercury, lead, and zinc.

2. *Vegetable Colouring Matter.*—Gamboge.

3. *Coal Tar Colours.*

Number in colour index of Society of Dyers and Colourists, 1924.	Name.	Synonyms.
7	Picric acid.	Carbazotic acid.
8	Victoria yellow.	Saffron substitute ; dinitroresol.
9	Manchester yellow.	Naphthol yellow ; martius yellow.
12	Aurantia.	Imperial yellow.
724	Aurine.	Rosolic acid ; yellow coralline.

THE SECOND SCHEDULE.

Labelling of Articles of Food containing Preservative and of Preservatives.

1. The articles of food containing preservative to which the Rules as to labelling set out in this Schedule apply are sausages, sausage-meat, coffee extract, pickles and sauces, and (where the proportion of benzoic acid exceeds 600 parts per million) grape-juice and wine.

2. (1) Where any of the said articles of food contains preservative it shall bear a label on which is printed the following declaration or such other declaration substantially to the like effect as may be allowed by the Minister :—

(a) **CONTAIN(S)
PRESERVATIVE.**

(2) The declaration shall be completed by inserting at (a) the word "This" or "These," followed by the name of the food as used in paragraph 1 of this Schedule.

(3) In the case of grape-juice or wine to which these Rules apply there shall be added to the declaration the words "and is not intended for use as a beverage."

3. (1) An article sold as a preservative shall bear a label on which is printed the following declaration or such other declaration substantially to the like effect as may be allowed by the Minister :—

**THIS PRESERVATIVE CONTAINS
(a) PER CENT. OF SULPHUR DIOXIDE.**

(2) Where the article contains benzoic acid the words "Benzoic Acid" shall be substituted for the words "Sulphur Dioxide."

(3) The declaration shall be completed by inserting at (a) in words and figures, excluding fractions (e.g., "seventy (70)"), the true percentage of the sulphur dioxide or benzoic acid present in the article.

4. The prescribed declaration shall in each case be printed in dark block type upon a light coloured ground within a surrounding line and no other matter shall be printed within such surrounding line. The type used shall be not less than one-eighth of an inch in height, or, in the case of grape-juice or wine to which these Rules apply, one-sixteenth of an inch in height.

5. The label shall be securely affixed to the article or be part of or securely affixed to the wrapper or container, and in any case shall be so placed as to be clearly visible. If the article bears a label containing the name, trade mark, or design representing the brand of the article or the name and address of the manufacturer or dealer the prescribed declaration shall be printed as part of such label.

6. No comment on or explanation of the prescribed declaration (other than any direction as to use in the case of a preservative) shall be placed on the label or on the wrapper or container.

THE PREVALENCE OF VENEREAL DISEASE.

THERE is no compulsory notification of venereal cases, so that the figures recently circulated as to the numbers of cases of venereal disease dealt with for the first time at treatment centres in England and Wales during each of the years from 1919 to 1924 are of interest.

Year.	Cases.*	Attendances.†	Year.	Cases.*	Attendances.†
1919	82,797	1,002,791	1922	56,347	1,560,568
1920	85,531	1,488,514	1923	55,945	1,605,617
1921	66,820	1,612,592	1924	54,380	1,645,415

* No. of cases dealt with for the first time at treatment centres in England and Wales during the year and found to be suffering from venereal disease.

† Total No. of attendances at treatment centres during the year.

The total number of attendances at the centres during each of those years does not bear out the pessimistic estimates that have been very usual.

CRESER'S PATENT DEODORISER AND DISINFECTANT CONTAINER.

WE have received from Mr. A. T. Creser, of 3, Manor Park, Richmond, Surrey, an apparatus designed for use in deodorising and disinfecting w.c.'s, which seems to possess decided advantages both of efficiency and economy. It consists of a perforated non-rustable metal cylinder containing a disinfectant in a solid but soluble form. The cylinder is simply and easily fixed under the rim of the w.c. pan, and in the track of the high-velocity water which washes out a certain amount of the disinfectant contained in the cylinder. On the rush of water ceasing, the drainage of the container automatically gives to the water in the pan, after the valve is closed, a strong solution of the disinfectant, which remains in the pan until the water is again set flowing. The apparatus can be refilled in less than 15 seconds, each refill will last from two to three months, and the cost of usage is approximately $\frac{1}{4}$ d. a week.

AFTER 50 years at 1, Fenchurch-avenue, E.C. 3, Messrs. F. W. Berk and Co., Ltd., the well-known chemical manufacturers, are removing their head offices on Monday, August 24th, to larger premises at 106, Fenchurch-street, London, E.C. 3.

STUDENTS' GUIDE—SESSION 1925-1926.

THE scheme upon which the Students' Number of THE LANCET is constructed will make it easy, we hope, for all who consult it to find what they seek. The General Council of Medical Education and Registration is the controlling authority of all the medical and dental education of the country, and its responsibility for the upkeep of the Medical Register and for the maintenance of the examination standard is first explained.

But the student has to be taught as well as examined, and as the systems under which instruction can be obtained do not conform to one pattern, the various curricula are described in detail, and under their respective headings the necessary information will be found concerning the facilities for medical study offered at the different teaching centres of the United Kingdom. The regulations for the examinations, both preliminary and professional, at these centres are set out so that the student desiring to obtain a medical degree from any university, or a diploma from any medical corporation, may ascertain the course of clinical instruction and the conditions under which submission for examination has to take place. The metropolitan medical schools and hospitals are grouped under the University of London, of which they are constituent bodies, although their educational opportunities are offered to students of other universities as well as to those seeking the qualifications of the medical corporations. A similar plan is adopted in dealing with the provincial universities, the hospitals in direct connexion with which are described with the universities; the hospitals may not be official schools of the universities, but they supply an integral section of the teaching required.

Upon securing degrees or diplomas admission to the Register follows, and greater education begins. The prudent young doctor already knows what he or she desires to make the next step, and there is a large range of choice displayed. The inducements to enter one of the Services should prevail more than they have done of recent years. An account is given of the conditions under which commissions can be obtained in the Navy, Army, Indian, and Air Force Medical Services, and in the Colonial and other Medical Services.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

POWERS, DUTIES, AND CONSTITUTION OF THE GENERAL MEDICAL COUNCIL.

THE powers and duties of the General Medical Council, or "General Council of Medical Education and Registration of the United Kingdom" to give the Council its full title, have been set out in detail in many previous Students' Numbers of THE LANCET. It is first a registering body: no person, even though his qualifications have been obtained by examination, is a legally qualified medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that medical education reaches an efficient standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner adjudged guilty of conduct "infamous in a professional respect." Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council at present consists of 38 members, of whom, as will be seen by the annexed list, all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. There are also three additional members appointed by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom (see p. 479).

The President of the General Council is Sir Donald MacAlister, and the sitting members of the Council are enumerated in the Medical Register.

THE EDUCATIONAL CURRICULUM.

Professional Education.—The course of professional study after registration occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

The following are the General Medical Council's Regulations in regard to the registration of medical students which came into force on Jan. 1st, 1923.

Registration of Medical Students.

1. Subject to such exceptions as the Council may from time to time allow, every medical student, at the commencement of his studies, should be registered under the conditions hereinafter set forth.
2. Before registration every candidate should produce evidence that he has attained the age of 17 years.
3. The minimum standard of General Education required is that of University matriculation or entrance examination in the Faculties of Arts or Pure Science.
4. Before registration as a student every applicant should be required to have passed an approved examination in general education, and, in addition thereto, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.
5. A student who has diligently attended an approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may be admitted to the professional examination in elementary biology immediately after his registration as a student.
6. The commencement of the course of professional study recognised by any of the licensing bodies should not be reckoned as dating earlier than 15 days before the date of registration.
7. Every person desirous of being registered as a medical student should apply to the registrar of the division of the United Kingdom in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Medical Council; and should produce or forward to the registrar evidence that he has attained the age of 17 years, that he has passed a preliminary examination in general education recognised by the General Medical Council, and, in addition, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies, and that he has commenced medical study.

Regulations which the Council has prescribed for the maintenance of the register of medical students:—

1. It shall be delegated to the Education Committee to prepare and issue from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the General Medical Council.
2. The Council has recognised the undernoted university examinations, subject to the conditions specified below: viz., at Oxford University, Responsions; at Cambridge University, the Previous Examination; at the Scottish Universities, the Preliminary Examination; and the Matriculation Examination at the Universities of Birmingham,

Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, and Wales.

3. The conditions prescribed by the Council are:—

(1) The standard of the examination shall not be lower than that of the University Matriculation Examinations in the Faculties of Arts and Pure Science. (2) The certificate shall bear evidence that the candidate has passed in the following subjects, viz.:—(a) English. (b) Mathematics, Elementary. (c) A language other than English. (d) An additional subject or subjects, as required by the regulations of the particular examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science, Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose.

4. Subject to the conditions specified above (Section 3, Subsection (2)), the Council will recognise all examinations conducted by recognised authorities in Great Britain accepted by one or more of the above-named Universities as equivalent for purposes of Matriculation to an examination named in the preceding list (Section 2). Bristol University: Higher School Certificate Examination; Schools Certificate Examination. Cambridge Local Examinations and Lectures Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Senior Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: General School Examination; Higher School Certificate Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

5. The Council will continue to recognise examinations conducted by educational bodies other than those (referred to in Section 4) directly recognised by the Universities of Great Britain. Recognition will not be extended under this section to any examination unless the Council is satisfied (1) that in scope and standard it is equivalent to a recognised Matriculation Examination of a British University, and (2) that it fulfils the conditions specified by the Council (Section 3, Sub-section (2)). Such examinations are:—The College of Preceptors (England): Senior Certificate. The Educational Institute of Scotland: Preliminary Medical Certificate.

Examinations in Ireland.—6. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, the Matriculation Examinations of the National University of Ireland and the Queen's University of Belfast, the Preliminary Examination of the Irish Royal Colleges of Physicians and Surgeons, the Leaving Certificate of the Intermediate Education Board of the Irish Free State, and the Senior Leaving Certificate of the Ministry of Education of Northern Ireland, and all examinations accepted by one or more of the Universities as equivalent for purposes of entrance or Matriculation, to the above-named examinations.

7. The Council will recognise the Final Examinations for Degrees in Arts and Science of any University of the United Kingdom or of the British Dominions.

Colonial Examinations.—8. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise all examinations of Colonial Universities which are accepted by one or more of the British Universities as equivalent, for purposes of Matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

A copy of the Medical Students Register prepared by each of the Branch Registrars is transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who supplies an alphabetical list of

all students registered in the preceding year to each of the licensing bodies in the United Kingdom, and to each of the several medical schools and hospitals.

All applications for special exceptions to the foregoing regulations as to registration should be addressed to the Registrar of the General Council.

Lists of Universities (including their Colleges and Medical Schools) and Schools of Medicine at which Medical Study may be Commenced in the United Kingdom.—1. Universities (including their colleges): Aberdeen University; Belfast, Queen's University; Birmingham University; Bristol University; Cambridge University; Dublin University (including Trinity College); Durham University (including the Durham College of Medicine); Edinburgh University; Glasgow University (including Queen Margaret College); Ireland, National University (including University College, Cork; University College, Dublin; University College, Galway); Leeds University; Liverpool University; London University (including the following Schools and Colleges: St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College, King's College Hospital, London Hospital, St. Mary's Hospital, Middlesex Hospital, St. Thomas's Hospital, University College, Westminster Hospital, London (Royal Free Hospital) School of Medicine for Women; Bedford College, Royal Holloway College; Manchester, Victoria University; Oxford University; St. Andrews University (including University College, Dundee); Sheffield University; Wales, University of (including University College of Wales, Aberystwyth); University College of North Wales, Bangor; University College of South Wales and Monmouthshire, Cardiff; Welsh National School of Medicine, Cardiff; University College, Swansea. 2. Schools of Medicine Recognised by the Licensing Bodies:—Dublin: Royal College of Surgeons, Schools of Surgery; Edinburgh: School of Medicine of the Royal Colleges; Glasgow: Anderson's College, St. Mungo's College.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallamstreet, Portland-place, London, W. 1.

THE IRISH FREE STATE AND THE GENERAL MEDICAL COUNCIL.

On August 15th the announcement was made by the Government of the Irish Free State that the Executive Council had decided "not to seek the continuation of the United Kingdom arrangement whereby the medical profession in Ireland with certain representations is controlled by the British General Medical Council."

When the autonomous Free State was set up in January, 1922, early negotiations with the Provisional Government procured the remaining in force of the existing arrangement as to the Medical Acts, unless and until the Irish Free State saw fit to legislate for practitioners within its own area. But the Free State making no move, it was indicated from the General Medical Council that this should be done explicitly if it was wished to preserve the connexion. Last year a Bill was introduced into the Free State Parliament authorising the General Medical Council to continue jurisdiction for a period of one year. This Bill was passed by the Senate of the Free State on Feb. 23rd, 1925, from which date it became effective for the indicated period, but there was opportunity given for extension of the interim measure. At a conference held in April of this year in Dublin, the Minister of Local Government and Public Health of the Free State, in whose department the matter lay, met representatives of the medical profession in the State, when it was urged by the representatives that the existing status should not be disturbed; but the recent decision of the Government of the State is to set up a separate medical register.

If the intention of the Government of the Free State proceeds to action a new Act of Parliament will be required.

THE
MEDICAL EXAMINING BODIES
AND
SCHOOLS OF THE UNITED KINGDOM.
A GUIDE TO THE FACILITIES FOR OBTAINING THE
VARIOUS MEDICAL DEGREES AND OTHER QUALIFICA-
TIONS FOR THE BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.
THE UNIVERSITIES.

UNIVERSITY OF OXFORD.

THIS University confers two degrees in Medicine, those of *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health* and *Ophthalmology*.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the *B.A.* degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of *B.M.* and *B.Ch.* the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (a) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (b) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, *Materia Medica* and Pharmacology. The First and Second Professional examinations are held in June and December. The first *B.M.* examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing the First Examination, the candidate can, on producing certificates, present himself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, *Materia Medica* and Pharmacology; but cannot enter for examination in Medicine, Surgery and Midwifery until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First *B.M.* Examination. He must pass in Medicine, Surgery and Midwifery at one and the same time.

Before admission to the Second *B.M.* Examination, the student must produce certificates of having attended laboratory courses in Pathology, Bacteriology and Pharmacology either in Oxford or in a recognised medical school. He must also produce certificates of having acted as Clinical Clerk and Dresser, each for six months, in a medical school approved by the University, of post-mortem clerking, of attendance on Labours, of instruction in Infectious Diseases and Ophthalmology, of proficiency in vaccination and the administration of anaesthetics, and of three academic years of Hospital Practice.

The degree of *B.Ch.* is granted with that of *B.M.* after passing the above examinations. The degree of *D.M.* is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by the examiners for the *B.M.* degree whose subjects are dealt with therein and by Professors in the Faculty of Medicine. The degree of *M.Ch.* is granted after examination to Bachelors of Surgery in the University who have entered upon their twenty-first term, and who are Members of the Surgical Staff of a recognised hospital, or have acted as Dresser or House Surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and

Surgical Operations, is held annually in June, after the Second *B.M.* examination.

The examinations for the Diploma in Public Health (see p. 474) in two parts are held in Trinity and Michaelmas terms; that for the Diploma in Ophthalmology (see p. 473) is held annually in July.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year on the nomination of the Regius Professor of Medicine. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships is usually £80 a year for four years; the exhibitions vary in value from £30 to £90 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

In addition to the University Lectures and classes the several Colleges provide their undergraduates with tuition for all examinations up to the *B.A.* degree.

In the Radcliffe Infirmary and County Hospital elementary clinical instruction is given by the Regius Professor of Medicine, the Litchfield Lecturers in Medicine and Surgery, and the other physicians and surgeons. Instruction is also given in post-mortem work and Clinical Pathology in connexion with the courses in Pathology. Post-graduate courses are held at the beginning of October.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1923 (both of which are published by the Clarendon Press); from the Regius Professor of Medicine; from the Professors in the several departments of medical science; and from the Dean of the School of Medicine, Department of Medicine, Museum, Oxford.

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities

are offered to students who wish to act as surgical dressers and clerks. The hospital contains 225 beds.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being a graduate of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing the Examinations for the ordinary B.A. degree, or an Honours degree by passing a Tripos Examination. The Natural Sciences Tripos is taken most frequently by medical students, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine (M.B.)* five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The first includes (1) General and Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The second is divided into three parts—viz., (1) Organic Chemistry, (2) Human Anatomy and Physiology; and (3) Pharmacology and General Pathology. The third is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic. Candidates who have passed both parts of the third M.B. examination are admitted to the registrable degree of *Bachelor of Surgery (B.Chir.)* without separate examination and without keeping an Act.

The degree of *Doctor of Medicine (M.D.)* may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five years, and if an M.A., to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis sustained in the Public Schools with *viva voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology,

the Practice of Medicine, State Medicine, or the History of Medicine.

For the degree of *Master of Surgery (M.Chir.)* the candidate must have passed all the examinations for B.Chir., or, if he is an M.A., have obtained some other registrable qualification in surgery. He is required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. Before he can be admitted to the examination two years at least must have elapsed from the time when he completed all required for the degree of B.Chir.

Diplomas are granted in Public Health, in Hygiene, in Tropical Medicine and Hygiene, in Medical Radiology and Electrology, and in Psychological Medicine. Candidates must hold a recognised medical qualification. (See p. 472.)

Women Students.—Increased facilities have been offered to students of Girton and Newnham Colleges and they are admitted to the M.B. Examinations.

University Prize in Medicine.—The one University Prize in Medicine, the Raymond Horton Smith Prize (value £19), is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a tripos examination. Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon sending a stamped directed envelope to the Registrar, The Registry, Cambridge.

ADDENBROOKE'S HOSPITAL.—Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London was established by Royal Charter in 1836 as an examining and degree-conferring body with affiliated colleges but no direct teaching functions. In 1900 it was reconstituted under the Act of Parliament, 1898, and became a teaching as well as an examining body. Many schools already existing became constituent colleges, including all the metropolitan medical schools. Lecturers were also appointed in special subjects.

Teaching Staff.—The teaching staff of the University is organised under two heads: 1. Appointed teachers—i.e., such as are appointed by the University. 2. Recognised teachers—i.e., those who have been appointed and are paid by the several schools of the University and other institutions at which instruction is given under the auspices of the University, and who have been recognised by the Senate as conducting work of University standard. Courses by non-recognised teachers may also be approved in schools of the University. The lecturers in the Medical Sciences and the professors in the Faculties of Medicine in University College, London, and King's College, London, will be found enumerated under their respective schools.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (a) under the direct control of the University or a committee appointed thereby; or (b) under one or more of the appointed or recognised teachers of the University.

Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. Internal students must pursue their studies at one of the above centres, or at one of the medical schools connected with the University. These are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. The London School of Tropical Medicine, the Lister Institute of Preventive Medicine, the Maudsley and Bethlem Royal Hospitals are also recognised as schools of the University in special departments. External students are all other matriculated students, and may pursue their studies at other approved universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.—The Faculty of Medicine grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*); the two higher degrees being open only to candidates holding the M.B., B.S. degrees of the University.

The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University, to be obtained from the Principal Officer, University of London, South Kensington, S.W. 7.

A. Internal Students.—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) *Attended* prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (a) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (b) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and Pharmacology; (c) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynaecology, Pathology, Forensic Medicine, and Hygiene.

B. External Students.—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Tuesday following the third Monday in March and on the second Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for

Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (a) Fevers, (b) Children's Diseases, (c) Venereal Diseases, (d) Mental Diseases (at a recognised Asylum), (e) Dermatology, (f) Vaccination, (g) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (a) Operative Surgery, (b) Applied Anatomy, (c) Administration of Anæsthetics, (d) Dental Surgery, (e) Orthopædic Surgery; (f) Mechano-therapeutics; (12) Obstetrics and Gynaecology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynaecological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynaecology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynaecology. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year and commences on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology and Rhinology. A thesis may be submitted as for M.D.

Bachelor of Pharmacy.—The Senate has approved the institution of the Degree of Bachelor of Pharmacy (B. Pharm.). The course for this Degree extends over three years.

Fees.—Matriculation £2 12s. 6d. for each entry; at provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6s. for each entry to the entire examination. For re-examination in one subject the fee is £2 2s. Second examination, Part I. £3 3s., repeated on each subsequent entry; Part II. £9 9s. for the whole

examination. Third examination: £12 12s. for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10s. M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.¹

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. It receives over 9000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopaedic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day, except Saturdays, at 1.30 P.M., and Surgical consultations are held on Thursdays at the same hour. Medical consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical lectures on all special subjects are also given. Wholtime Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board, and receive a salary of £80 a year. Three resident administrators of anaesthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the Medical College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions. Facilities

for research work are afforded in the Clinical Units and the Laboratories of the pathological and other departments. A *Vacation Post-graduate Course*, adapted to the needs of general practitioners, is given annually. The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (a), (b), two Entrance Scholarships in Science of the respective values of £75 and £100; (c) Entrance Scholarship in Arts, £100; (d) Jeaffreson Exhibition, £50; and (e) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (a) and (b) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (c) and (d) are awarded after examination in Latin, Mathematics, and Greek or French or German; (e) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(f) No. 1, £30, Anatomy and Physiology; (g) No. 2, £20, Anatomy and Physiology; (h) No. 3, £25, Chemistry, Physics, and Biology; (i) No. 4, £15, Chemistry, Physics, and Biology; (j) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (k) Kirkes Scholarship, £30 and medal, Clinical Medicine; (l) and (m) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (n) Sir G. Burrows Prize, 10 guineas, Pathology; (o) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (p) Matthews Duncan Medal and Prize, £20, Midwifery and Gynaecology; (q) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (r) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (s) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

Information may be obtained on application to the Dean of the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. Over 3000 cases pass through its wards each year, and some 24,000 out-patients and casualties are treated. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopaedic Cases, X Ray work, and for Electrical Treatment.

Appointments.—In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Medical, Surgical, and Obstetric Registrars to the Hospital are appointed annually. Six House Physicians, six House Surgeons, and two Resident Obstetric Officers are appointed each year.

Primary and Intermediate Studies.—By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk.

Final Studies.—These are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped Laboratories has been established in the School. Students receive their training in Preventive Medicine, Pathology, Bacteriology, and Biochemistry here, and are encouraged to undertake Research. Special facilities are available for Post-graduate Research and Study.

¹ For Ancillary Metropolitan Medical Schools see p. 437.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital adjoining. Special demonstrations are arranged for Post-graduates.

The *Museum* contains over 4000 specimens, including a notable collection of over 800 gynaecological specimens, "The Cuthbert Lockyer Collection."

Students' Club.—The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, &c. The Club, which is under the control of a Committee of Students, provides needful athletic recreation, and includes the Medical Society. An athletic ground, comprising six acres, has recently been acquired and is now in use.

Women Students.—Women students are admitted to the School and Hospital upon the same terms and conditions as men, and after qualification are eligible for resident Hospital appointments.

Fees.—Entrance: Primary and Intermediate, 10 guineas; Final, 8 guineas; Annual, £42.

Further information may be obtained on application to the Dean, Dr. W. J. Fenton, Medical School, Charing Cross Hospital, London, W.C.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. One ward is set apart for Diseases Peculiar to Women, and there is a Maternity Ward of 11 beds. Children's beds are placed in the women's wards. Two wards are allotted to ophthalmic cases.

Entrance Scholarships and Endowed Prizes of a total value of £700 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Twelve house physicians, 12 house surgeons, and 12 casualty officers are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Officer to the Atkinson-Morley Convalescent Hospital, at £300 per annum; Medical Registrarship at £200 per annum, Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anaesthetist at £100; the posts (2) of Junior Anaesthetists, each at £30. The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises, and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Scholarships and Prizes.—At this school five entrance scholarships are given, the money value and the subjects of examination being as follows: (a) and (b) two William Brown Exhibitions, £120 and £80 respectively; (c) and (d) two University Entrance Scholarships, 90 guineas and £70 respectively; (e) Devitt-Pendlebury Scholarship, £50, Anatomy and Physiology. This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to six in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (f) Allingham Scholarship in Surgery for Students qualified not more than two years, £85; (g) and (h) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (i) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (j) Pollock Prize, £23, Physiology, Physiological Chemistry, and Histology; (k) Clarke Prize, £5; (l) Thompson Medal, £9, Clinical Reports;

(m) Brodie Prize, £8, Clinical Reports; (n) Webb Prize, open to perpetual pupils, £34, Bacteriology; (o) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

Further information may be obtained from the Dean of the Medical School, Dr. J. A. Torrens.

GUY'S HOSPITAL.—This hospital, founded by Thomas Guy in 1724 for the reception of 400 patients, and enlarged through the aid of a large bequest from the late William Hunt, contains at the present time 616 beds. The whole of the medical school has been rebuilt during the last 27 years. It provides ample accommodation, with modern equipment, for all the non-clinical subjects of the medical curriculum. Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 20 minutes from the hospital.

House physicians, house surgeons, out-patient officers and assistant house surgeons, obstetric residents, house surgeons in the departments of ophthalmology and genito-urinary diseases, house physician in the department for diseases of children, clinical assistants, clerks to anaesthetists, surgeons' dressers, clerks to medical units, post-mortem clerks, extern obstetric dressers, and dressers and clerks in the special departments are appointed from among the students upon the recommendation of the Medical Council according to merit. There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynaecology, diseases of children, diseases of the nervous system, dermatology, otology, actinotherapeutics, anaesthetics, dentistry, orthopaedics, vaccine, tuberculosis, genito-urinary and venereal diseases, Salomon's Welfare Centre (for Maternity and Children).

Scholarships.—Six entrance scholarships are awarded annually as follows:—(a) one War Memorial scholarship, providing a free Medical Education for five years of the value of £200, to be awarded alternately in Arts and Science (next award, July, 1926); (b) one Open Arts Scholarship of £100 for students under 21 years of age, Latin, English, Greek, or French or German, Arithmetic, Euclid, and Algebra; (c) one Open Junior Science scholarship for students under 21 years, £100; subjects, any two of the following: Inorganic Chemistry, Physics, and Biology; (d) a confined Junior Science scholarship of the value of £100 is offered for competition, annually in July, to candidates who have attended the Preliminary Science Classes at this School; (e) two open Science scholarships: (1) a War Memorial scholarship of the value of £80, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students under 25 years of age who have completed the curriculum for, or passed the examination in, Anatomy and Physiology for a medical degree in any University of the British Empire, and have not entered as students in any Metropolitan Medical School; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry, Pharmacology, General Pathology.

In agreement with the practice of the Universities, an allowance will be made (1) for Military Service performed by candidates, the term "military service" meaning service in the Naval or Military Forces of His Majesty or of His Majesty's Allies during the war; or (2) in respect of other approved duties in connexion with national defence.

The Dean of the Medical School is Professor T. B. Johnston, from whom information may be obtained.

UNIVERSITY OF LONDON: KING'S COLLEGE.—The medical department (Faculty of Medical Science) at this College only deals with Preliminary and Intermediate subjects, and instruction in these subjects is given in the College laboratories by university professors and their assistants to students entering the College directly and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The department is open to both men and women.

Scholarships.—(a) Two Warneford Entrance Scholarships of £30 each for four years. Examination in July, subjects selected from Divinity, Classics, Science. (b) Sambrooke Scholarship of £30 for three years. Examination in April or May, subjects selected from Classics, Science. (c) Worsley Scholarships: £100 in five annual instalments of £20. (d) Rabbeth Scholarship of £20 for best work in first year. (e) Second Year Scholarship of £20 tenable for one year. (f) Daniell Scholarship of £40 for one year. Awarded on University Honours Examination.

Fees.—Tuition fee of 35 guineas for the first year, £12 per annum for the second and third years, with a materials fee of 4 guineas in the first year, 6 guineas in the second year, 4 guineas in the third year. For prospectus and further information application should be made to the Dean of the Medical Faculty (Professor E. Barclay-Smith), King's College, Strand, W.C. 2.

Dental Course.—The College, in association with King's College Hospital, has instituted courses for the Degree in Dental Surgery of the University of London and for the Dental Diploma of the Conjoint Board.

Fees.—First year (Chemistry and Physics), 20 guineas; second and third years (Anatomy, Physiology, Dental Mechanics, and Dental Metallurgy), 52 guineas per annum. Fourth and fifth years (Hospital), 60 guineas per annum. For prospectus and further information application should be made to the Secretary, King's College Hospital Medical School, Denmark Hill, S.E.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—The advanced subjects in the curriculum are taught at the Medical School of King's College Hospital, which is situated at Denmark Hill, S.E. 5. The hospital stands in the midst of a large South London population, from which an immense amount of clinical material is forthcoming. During the past year there were 196,211 attendances in the out-patient and casualty departments. Accommodation for 400 beds for in-patients has been built, and provision will ultimately be made for 600 beds. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynaecology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopaedics, Otology, Physiotherapy, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry. The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers, house physicians and house surgeons; resident anaesthetist; resident radiologist; bacteriologist; clinical pathologist; pathological registrar; and medical, surgical, and obstetric registrarships. Sixteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Prizes.—(a) Warneford Scholarships, (b) Sambrooke Scholarship, (c) Rabbeth Scholarship, £20; (d) Medical Entrance Scholarships, £50 (Anatomy and Physiology), and £50 (Pathology and Pharmacology) open to students who (1) propose to take a degree at any British University, and have passed their University examination in Biology, Chemistry, and Physics, and who (2) will become students at King's College Hospital from date of entering upon Scholarship; (e) A Medical Entrance Scholarship in

Science, value £50, tenable for five years, successful candidates to study at King's College and King's College Hospital; (f) Three Medical Scholarships, £40 for fifth-year students, £20 for third-year students, and £20 for second-year students; (g) Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital; (h) Carter Prize, £15, Botany; (i) Tanner Prize, £10, Obstetrics and Diseases of Women; (j) Todd Prize, £4 4s. and medal, Clinical Medicine; (k) Two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the nomination of the Regius Professors; (l) two Raymond Gooch Scholarships, £120 each, open to students of British Universities on certain conditions; (m) an Epsom College Scholarship, value £50, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London. The Warneford and Sambrooke Scholars are required to take the subjects of the preliminary and Intermediate examinations at King's College, and the final subjects at King's College Hospital.

Dental School.—When the Hospital was built accommodation was provided for a Dental Department. Arrangements have been made for the use of this section, together with additional rooms for Dental Metallurgy, by the Dental School, which was opened in November, 1923, under the direction of Mr. A. Livingston, M.B., Ch.B., Mast. Dent. Surg. A full course is given in coöperation with King's College, and includes arrangements for students who desire to avail themselves of the special provisions of the Dentists Act.

Athletics.—The King's College Hospital Clubs and Societies Union was formed in 1908, and consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. An athletic ground, over six acres in extent, has been provided for the use of the students on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes"—a hall of residence available for students belonging to the hospital.

Fees.—The composition fee for Hospital work and Final Medical subjects of the curriculum is 93 guineas if paid in one sum, or 95 guineas if paid in two instalments, in addition to the Entrance Fee of 10 guineas. The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, Dean; Mr. S. C. Ranner, Secretary of the Medical School, King's College Hospital, Denmark Hill, S.E. 5.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in the Mile End-road, E. The hospital contains 950 beds, which are in constant use, and is the only general hospital for East London. During last year 17,975 in-patients and 131,969 out-patients received treatment, while 7656 major operations were performed. 36,023 out-patients attended the special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, &c., and the Pediatric, Orthopaedic, Venereal, Radiological, Electro- and Physico-Therapeutical and Inoculation Departments. The hospital presents, therefore, a large field for clinical instruction, and in its Wards and Out-patient Departments exceptional opportunities are afforded for acquiring an extensive and practical experience in all phases of disease.

A Clinical Unit in Medicine, under the charge of a whole-time director, provides for the more elaborate methods of diagnosis and treatment, and takes a leading part in the initiation and coördination of medical research.

To each medical and surgical firm throughout the hospital there is attached a First Assistant, who is responsible for instructing the clerks or dressers of the firm in elementary medicine and surgery, and who assists the honorary members of the firm in the preparation of their demonstrations. Special courses of lectures and demonstrations are arranged

in Medicine and Surgery and their ancillary subjects. Opportunities for research are provided under the supervision of the staff.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. Special entries for medical and surgical practice can be made. A residential Hostel on hospital grounds is provided for the convenience of students. The Union Athletic Ground, 13 acres, is within easy reach of the hospital.

Scholarships and Prizes.—The following is a list of the Scholarships and Prizes:—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, £75, Human Anatomy and Physiology; Buxton Prize, £40, subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynaecology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; eight Dressers' Prizes, amounting to £40, zeal, efficiency, and knowledge of Elementary Clinical and Minor Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; Treves Prize, £15, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, biennial, £26, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; K. E. D. Payne Prize, £20, Pathology; and Liddle Prize, triennial, £120.

Medical Research Funds.—Funds to the value of approximately £40,000 permit of financial assistance being given to students and graduates engaged in Medical Research.

Dean: Professor William Wright, London Hospital Medical College, E. 1.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—The Hospital and Medical School are situated close to Paddington station (G.W.R.) having on one side a poor district of 500,000 persons, and on the other side the residential districts of Kensington and Bayswater. The hospital contains 288 beds and, by a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals, the teaching facilities extend over 1000 beds. The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has recently been added.

Clinical Facilities.—Clinical Units in Medicine and Surgery were established in 1920, and have now been formally recognised by the University Grants Committee, St. Mary's being one of the six Medical Schools in London which enjoy this privilege. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Institute of Pathology and Research.—Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright, F.R.S.

Appointments.—Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and research beds have been instituted. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Patho-

logical and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly-qualified members of the Medical School, including ten salaried posts with salaries varying from £200 to £750 per annum.

Complete Curriculum.—The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Entrance Scholarships.—Three Entrance Scholarships of the value of £210 each are awarded annually, and two University Scholarships of £200.

Fees.—Composition Fee for entire curriculum (5½ years) £200 in one sum, or £210 by four annual instalments. Composition Fee for Clinical curriculum (2½ years) 90 guineas in one sum, or 95 guineas by two annual instalments. As an alternative, students may pay an annual fee of 40 guineas with an entrance fee of 10 guineas.

MIDDLESEX HOSPITAL.—The hospital contains over 450 beds, with special wards for Cancer, Maternity and Gynaecological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous diseases, Orthopaedic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electro-Therapeutic department. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electro-Therapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

The Medical School, which includes the Bland-Sutton Institute of Pathology and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly, commencing in April and October. Ample laboratory and classroom accommodation is provided. The teaching staff includes 6 Professors, 30 recognised Teachers, 8 Demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology is completely equipped for routine hospital investigations, teaching and research work, and contains a new lecture theatre and large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility.

Other features of interest are: the institution of a course in Medical Radiology and Electrolgy, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone. Primary F.R.C.S. class will resume in July.

Special classes are held to prepare students for the Intermediate Examinations of the Universities.

Hospital Appointments.—All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynaecological house surgeons, two casualty medical officers, two casualty surgical officers, one resident anaesthetist, and two resident officers to the special departments. The medical and surgical casualty officers are appointed twice a year. Eight registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

Scholarships, Prizes, &c.—Two Entrance Scholarships, value £100 each, and two University Scholarships, value £90 and £60, are awarded annually in September. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship for Foundationers or Council Exhibitioners of Epsom College is awarded annually on the nomination of the Headmaster. There are

also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5s.; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Leopold Hudson Prize, value 11 guineas; and the Second Year's Exhibition, value 10 guineas. There are also numerous class prizes.

Fees.—The fees are arranged on a basis of an annual payment of approximately £45 for the six years of the curriculum. After six years, if the student is not qualified, the annual fee is £23.

The Amalgamated Students' Club includes the following: the Medical Society, the Common Room Society, Musical Society, the cricket club, the football clubs, the athletic club, the rowing club, the musical society, the chess club, the lawn tennis club, and the hockey club. There are a restaurant and gymnasium in the school buildings, and large athletic grounds at Wembley, with new pavilion. The subscription to the Amalgamated Students' Club is included in the above fees. Full particulars on application to the Dean, Middlesex Hospital Medical School, W. 1.

ST. THOMAS'S HOSPITAL.—This Hospital received its present charter from King Edward VI., but as a monastic institution was in existence prior to the year 1207. The building occupies a unique position by the river, opposite the Houses of Parliament, and contains 644 beds. The in-patients last year numbered 10,139, whilst the number of attendances as out-patients, including the casualty and light departments, was 488,600. There are special departments for the treatment of women, children, diseases of the eye, ear, nose and throat, skin, teeth, and for orthopaedics. Nervous and mental diseases are treated in special departments. An electro-cardiograph has been installed for the investigation of diseases of the heart. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for Radiology, Electro-therapy, Phototherapy, Massage and Remedial Physical Exercises are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 p.m. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. All appointments in the hospital are open to students without extra fee. Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity Ward and district, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anaesthetics by the hospital anaesthetists. The Students' Club comprises a spacious restaurant and smoking and reading room. There is no occasion for students to leave the hospital buildings during working hours. The curriculum is arranged to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments Open to Students after Qualification.—A Resident Assistant Physician, a Resident Assistant Surgeon, and a Resident Anaesthetist are appointed annually at a salary of £200 each per annum. Two

Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. An Obstetric Tutor and Registrar, an Ophthalmic Registrar (at an annual salary of £50 each), and an Orthopaedic Registrar (unpaid) are appointed yearly. Two Senior Resident Casualty Officers (Medical and Surgical) are appointed yearly. Eight Resident Casualty Officers and Anaesthetists are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopaedic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Fees.—The annual fees are: For each year of study £50. These fees cover all tutorial classes, but do not include instruction in infectious fevers, pharmacy, and vaccination. Qualified practitioners are permitted to attend the hospital practice on terms which may be ascertained from the Medical Secretary.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following subjects: Anatomy, Physiology, and Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (a) William Tite Scholarship for second-year students, £25; (b) and (c) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (d) Mead Medal, Medicine, Pathology and Hygiene; (e) Wainwright Prize, Medicine; (f) Toller Prize, Medicine; (g) Cheselden Medal, Surgery and Anatomy; (h) Clutton Memorial Medal in Clinical Surgery, biennial; (i) Beaney Scholarship, £50, biennially, Surgery and Surgical Pathology; (j) Solly Medal and Prize, biennial, Reports of Cases; (k) Sutton Sams Prize, biennial, Report of Cases; (l) Bristowe Medal, Pathology and Morbid Anatomy; (m) Hadden Prize, Pathology; (n) Grainger Testimonial Prize, £31 10s., Anatomy and Physiology; (o) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology.

The Dean of the Medical School is Sir Cuthbert S. Wallace, and the Medical Secretary Dr. A. Elliot, from whom any further information may be obtained.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences); also the Departments of Anatomy, Histology, Physiology, Biochemistry, and Pharmacology (the Intermediate Medical Sciences), and the Department of Hygiene and Public Health. Research work is undertaken in all departments. The completion of the Institute of Medical Sciences, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study in anatomy, physiology, and pharmacology. In particular might be specified the opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and experimental embryology. Arrangements exist for the close correlation of work in the Institute with University College Hospital and Medical School.

Faculty of Medical Sciences.—Composition Fees.—For the courses required by the University of London. 1. For the First Medical Course, 35 guineas, entitling to one attendance and to the privileges of the Union Society for one session. 2. For the Second Medical (Intermediate) Course 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance at Anatomy and Physiology during three years and to one attendance at Organic and Applied Chemistry, and Pharmacology, and to the privileges of the Union Society or the Women's Union Society for two sessions.

For the medical education required by the Examining Board in England: (i) For the course for the Premedical Examination, 35 guineas, entitling to attendance and to the privileges of the Union Society for one session. (ii) For the course for the First Examination, 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance during three years (including one attendance at each Practical Course in Physiology) in all subjects except Practical Pharmacy. It also entitles to the privileges of the Union Society for two sessions.

Scholarships and Prizes.—The first three items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (a) The Bucknill Scholarship, 160 guineas; (b) and (c) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (d) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, Pharmacology, and Chemistry; (e) Schafer Prize in Physiology, £18 triennially; (f) Sharpey Physiological Scholarship, £200, Biological Sciences; (g) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £16 a year; and (h) five Gold and five Silver Medals awarded annually in various departments.

Women students are admitted.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL. Dean: Sir George Blacker. Vice-Dean: Mr. Gwynne Williams. Secretary: Mr. G. E. Adams. Open to men and a limited number of women students. Fees for Preliminary and Intermediate Course: See under University College. For the Final M.B., B.S. (London) Course, 112 guineas if paid in one sum, 115 guineas if paid in two instalments, as follows—first year, 70 guineas; second year, 45 guineas. This fee entitles to attendance on lectures and hospital Practice during three years and to one attendance on Practical Pathology and Practical Surgery. Vaccination and attendance at a Fever Hospital are not included. This course of instruction is also suitable for the corresponding examinations at the Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. There are over 300 beds in the hospital.

Clinical Units in Medicine and Surgery are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. A Unit in Obstetric Medicine will be established as soon as the new Obstetric Hospital is finished.

The new buildings of the Obstetric Hospital of 60 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for 30 residents and students), the extension to the Nurses' Home, and the new research laboratories for the Medical School, are well under way, and these buildings should be ready for occupation in the coming winter session.

Special Departments, Clinical and Laboratory Facilities.—Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the

laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments tenable by Students.—Clerkships and dresserships to the physicians, surgeons, anaesthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Twelve house physicians, eight house surgeons, four senior and four junior obstetric assistants (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. The house physicians and house surgeons reside free in the hospital for six months, and the senior obstetric assistants for three months. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Medical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Casualty Medical Officer and a Casualty Registrar, Assistants in Ear and Throat, Ophthalmic, Skin and Venereal Diseases Departments, and House Anaesthetist.

Museum of Pathological Anatomy.—The Museum is open for study from 9 A.M. to 5 P.M. Microscopic sections of most of the specimens in the Museum have been prepared and are available for the use of students on application to the Curator. The Museum contains 1100 admirable paintings by Sir Robert Carswell and Sir Charles Bell and a collection of instruments formerly belonging to Robert Liston.

The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee.

The Medical Library is open daily for the purposes of study to every student of the Medical School from 9 A.M. to 5 P.M., Saturdays 9 A.M. to 1 P.M. It contains about 13,500 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School. The Athletic Ground, which is used in conjunction with the Union Society of the University of London, University College, is near the G.W.R. Perivale station.

Scholarships and Prizes.—At this School the first two Scholarships (a) and (b) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (c) and (d) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(a) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (b) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (c) and (d) two Goldsmid Entrance Exhibitions, 112 guineas each, Anatomy and Physiology; (e) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (f) Atkinson Morley

Scholarship, tenable for three years, £45 per annum, Surgery; (g) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (h) Magrath Clinical Scholarship, about £100, Clinical Cases; (i) Percival Allyn Scholarship, about £60, Surgery; (j) Filliter Exhibition, £30, Pathology; (k) Erichsen Prize, £10 10s., Practical Surgery; (l) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (m) two Liston Gold Medals for Clinical Surgery; (n) Alexander Bruce Gold Medal for Pathology and Surgery; and (o) Tuke Silver and Bronze Medals for Pathology. (p) Radcliffe Crocker Travelling Scholarship for Dermatology. (q) Leslie Pearce Gould Travelling Scholarship for Surgery.

Residence of Students.—University College Hall, Ealing, is recognised by the Medical School authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge. Gentlemen who desire assistance in their studies should consult the Dean or Lecturers.

WESTMINSTER HOSPITAL.—The hospital contains 236 beds and affords relief to upwards of 2500 in-patients and 25,000 out-patients annually. There are separate departments for Diseases of the Eye, Skin, Teeth, Ear, Nose, and Throat, for Orthopaedic practice, for Diseases of Women, for Diseases of Children, for Radiography, for Venereal Diseases, and for Massage, Electrical and Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to male and female students.

By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £70 each. Summer Session: Two Scholarships in Anatomy and Physiology, £70 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, tenable for two years, £20, Chemistry; Rabbeth Scholarship, open to First-year Students, £20; Class Examinations in the Preliminary Scientific Course; and the Sambrooke King's College Scholarship in Science, value £25. Inquiries may be addressed to the Dean, Dr. A. S. Woodward.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, 8, Hunter-street, Brunswick-square, W.C.—The fee for the medical course for the degrees of the University of London and for the diplomas of the Royal Colleges of England and for other qualifications is £240 in five instalments. This sum includes library and laboratory fees. Arrangements are made for pre-medical courses in Chemistry and Physics, which are included in these fees.

The Royal Free Hospital contains 240 beds. The Hospital also has large Casualty and Out-patient Departments, and Departments for Special Diseases. A new and specially equipped block contains the Obstetrical and Gynaecological Unit, which controls 68 beds. Two Research Fellows and a Research worker are engaged on work connected with the Unit. Maternity Districts are attached to the Unit operating in the Gray's Inn-road and Essex-road areas. A new Maternity Hostel has been acquired at 434, Essex-road. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysis and Epilepsy, South London Hospital, and Royal London Ophthalmic Hospital.

Courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the Royal London Dental Hospital, Leicester-square.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anaesthetist, medical, gynaecological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 16, Brunswick-square, 5, Mecklenburgh-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students. The Students' Union arranges the social, athletic, and other clubs and societies. The School sports ground, consisting of 6½ acres of freehold land, is situated at Sudbury (easily reached from Euston Station), and is being developed for tennis, hockey, lacrosse, and cricket.

Scholarships and Prizes.—(a) Isabel Thorne Scholarship, £30. (b) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (c) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years, and next to be awarded in 1927. (d) Bostock Scholarship, tenable for two or four years, and next to be awarded in June, 1927, £90. (e) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (f) Sir Owen Roberts Scholarship, £75 a year for four years. (g) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (h) Fanny Butler Scholarship, tenable for four years; next award in July, 1926, £14 10s. (i) John Byron Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies, application to the Secretary by March 31st, £20. (k) Helen Prideaux Prize, awarded every second year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £60. (l) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (m) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1927. (n) Dr. Margaret Todd Scholarship, tenable for four years, £37 10s. a

year, awarded in alternate years; next award in July, 1927. (o) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1928. (p) Alfred Langton Scholarships, tenable two years, one awarded annually, £50 a year. (q) School Jubilee Bursary, tenable for three years, £50 a year. (r) Flora Murray Bursary, awarded every year to a fifth-year student, £50. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2s. and £1 1s. are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5s., is awarded yearly. The Edith Pechey Phipson Prize in Pharmacology, value £3 3s., is awarded annually.

The Dean of the Medical School is Dame Louisa Aldrich-Blake, D.B.E., M.D., M.S.; the Honorary Secretary, Dr. May Thorne; and the Warden and Secretary, Miss L. M. Brooks, to whom inquiries may be addressed.

UNIVERSITY OF DURHAM.

To return to the curriculums of the Universities, there are six English provincial universities providing a full course for the medical student.

Nine degrees, two Diplomas, and one Licence are conferred—viz., the degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery, and Master of Dental Surgery, the Diploma in Public Health, Diploma in Psychiatry, and the Licence in Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects for the Third Examination are—Materia Medica, Pharmacology, Therapeutics and Pharmacy, Medical Jurisprudence, Public Health, and Pathology and Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynaecology, Psychological Medicine, and Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent at the University College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special clinical examination in the Theory and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates must not be under 40 years of age and must have been in active practice for 15 years as registered medical practitioners. They must also produce certificates of moral character from three registered members of the medical profession. The fee is 50 guineas (including the degree fee), of which 20 guineas is retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates

for this degree must be registered medical practitioners, and not less than 24 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad. The fee for the examination is £20, and the fee for the degree is £10.

Candidates for any of the above degrees, diplomas, or licence, must give at least 28 days' notice to Professor Howden, Registrar, College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before the 1st of April.

Scholarships and Prizes.—In connexion with this University the following Scholarships and prizes are awarded:—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £40 a year for three years (awarded every third year); Province of Durham Masonic (Entrance) Scholarship, £60; Heath Scholarship for Surgery, £200, available every second year.

The following Scholarships are tenable for one year, namely:—Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology; Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarship for Surgery, £40; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £48 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outtersen Wood Prize for Psychological Medicine, £10. At the end of each session a Prize of Books is awarded in each of the regular classes. For further information apply to Professor R. Howden, Registrar of the College.

COLLEGE OF MEDICINE, Newcastle-upon-Tyne.—Clinical instruction is given at the Royal Victoria Infirmary, containing about 550 beds. In it adequate accommodation is provided for the study of the various special subjects, in addition to the ordinary clinical work. Students do midwifery at the Princess Mary Maternity Hospital.

Post-graduate Instruction.—A comprehensive series of post-graduate courses has been arranged to enable practitioners to take advantage of the facilities for laboratory work and clinical study which are afforded by the College, the Royal Victoria Infirmary and other associated hospitals, and in order to meet the varied requirements of practitioners there are general and special courses in the winter and summer session as well as an intensive course in the summer vacation.

The Bacteriological Laboratory.—The Bacteriological Laboratory is adjacent to Armstrong College.

Students' Union Buildings have been erected and furnished at a cost of over £40,000, and are now in daily use.

Princess Mary Maternity Hospital.—The new Maternity Hospital was opened by H.R.H. Princess Mary Viscountess Lascelles in November, 1923. The

hospital is thoroughly up to date, excellently equipped, and there is an annual indoor and outdoor attendance of nearly 3000 cases.

NEWCASTLE-UPON-TYNE ROYAL VICTORIA INFIRMARY.—The Infirmary was founded in 1751, but has been entirely rebuilt, the new hospital being opened by His late Majesty King Edward VII. in 1906. The number of beds is 550. The number of in-patients annually is 12,000 and out-patients' attendances 297,000. The medical students of the University of Durham attend the practice of this hospital. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by the Assistant Physicians and Assistant Surgeons, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynaecological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory, in which all clinical bacteriological investigations are carried out—opsonic indices estimated with a view to treatment by vaccines and serums, &c. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1925 opens on Oct. 1st and the summer session of 1926 on April 13th. Applications for detailed information should be made to the Dean, Dr. Horsley Drummond, at the hospital.

There are other institutions in addition to the Royal Victoria Infirmary at which the student of medicine of the University of Durham can receive clinical instruction. Practical Midwifery can be studied at the Princess Mary Maternity Hospital, Newcastle-upon-Tyne, which contains 65 beds, with an annual indoor and outdoor attendance on 3000 cases. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye.

Post-Graduate Instruction.—For the year 1925-1926 the following post-graduate courses have been arranged:—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynaecology; Diseases of the Eye; Diseases of the Throat, Nose and Ear; Diseases of the Skin; Venereal Diseases; Neurology. Special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation, 1926. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at

another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Biology and Organic Chemistry. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof, and a recognised Pre-Medical Examination in Chemistry and Physics. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. **First Examination.**—Part I., Elementary Biology and Organic Chemistry.—Part II., Anatomy and Physiology. **Second Examination.**—General Pathology and Bacteriology, Materia Medica, and Pharmacy. **Third Examinations** (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, Therapeutics, and Special Pathology. Two years' hospital work must have been accomplished. **Final Examination.**—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital one month, and mental hospital three months. Vaccination instruction must be taken out and courses of Ophthalmology, Venereal and Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery.

Degrees of Doctor of Medicine and Master of Surgery. At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver, for the M.Ch. A thesis of exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and to submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, Part I., £2 10s.; First Examination, Part II., £2 10s.; Second Examination, £2 10s.; Third Examination, £2 10s.; Final Examination, £10; M.D. or Ch.M., £12 10s.

At the University of Birmingham the following Scholarships are awarded:—(a) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland (available for year 1925-26); (b) two Ingleby Scholarships of £10 each awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (c) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (d) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more

than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (e) Dental Scholarship of £37 10s., Open Competitive Examination in subjects learned during apprenticeship; (f), (g), (h), and (i) Four Queen's Scholarships of £10 10s. each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (j) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (k) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate passing the Final M.B., Ch.B. in June, who obtains the highest marks in Clinical Medicine, provided the marks so gained be not less than 60 per cent. The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in the fourth and fifth years (open to all students).

Post-graduate Courses.—A Lectureship in Morbid Psychology was established in 1919 in the University, and courses of lectures are given annually by specialists in the subject. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. Post-graduate Courses of Clinical Demonstrations (for General Practitioners) at the Birmingham General and Queen's Hospitals are arranged annually (April to July).

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital under the direction of the University Clinical Board. Appointments are open to students varying from £40 to £200 a year.

BIRMINGHAM GENERAL HOSPITAL.—370 beds are in daily use, 6000 in-patients per annum. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, Septic and Infectious cases; special beds for Eye and Skin cases. About 50,000 out-patients per annum. Laboratories for Bacteriology and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electro-therapy, Extern Midwifery, and Venereal Diseases. Post-graduate classes in every branch of medicine and surgery. The Jaffray Branch Hospital contains 56 beds.

QUEEN'S HOSPITAL (Beds 224).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely

assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, dentistry, radiography, pathology, bacteriology, massage, electricity, whirlpool baths, electro-cardiograph, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of over 250. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available on various subjects when a sufficient number of graduates are present. A limited number of Non-Resident Clinical Assistants posts are available to qualified practitioners, particulars of which can be had on application to the General Superintendent.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The fee is £5 for each examination. The subjects of the First Examination are: (1) Chemistry; (2) Physics; (3) Biology (Zoology and Botany). The subjects of the Second Examination are (a) (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology); and (b) (3) Elementary Bacteriology, (4) Clinical Chemistry, (5) General Pathology. Candidates may present themselves in (a) or (b) separately. The subjects for the Final Examination are: (a) (1) Special Pathology and Morbid Anatomy; (2) Forensic Medicine and Toxicology; (3) Public Health; (4) Pharmacology and General Therapeutics; (b) (5) Obstetrics and Diseases of Women; (6) Surgery, Systematic, Clinical, Operative and Practical, including Ophthalmology; (7) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may present themselves in Parts (a) and (b) separately, but candidates must have completed the fifth year of medical study before taking Part (b).

Degrees of Doctor of Medicine and Master of Surgery.—No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees, or, in the case of the degree of Doctor, unless, having obtained substantially equivalent degrees in an approved University, he has subsequently spent two years in the University or in the Clinical School in the performance of research or the conduct of systematic clinical observations. Candidates for the degree of Doctor of Medicine are required to present a thesis together with, if desired, published original work relative to medical science. An examination is required if the work submitted is not of special merit. If the work submitted is of special merit, but extremely specialised, a candidate may be asked to submit a reasoned report on a subject set by the examiners.

The University has recently established a Diploma in Medical Radiology and Electrology—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

At this University the following Scholarships and Fellowships and Prizes are awarded:—(a) Robert Gee Entrance Scholarship, annually, of £40, tenable for four years; (b) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (c) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination among Senior Students in Anatomy, Physiology, Pharmacology, and Materia Medica; (d) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and (e) Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (f) University Scholarship of £50 for one year, awarded on results of Second Examination for the degrees; (g) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (h) Gee Fellowship, Anatomy, of £100, for one year; (i) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (j) Johnston Colonial Fellowship, Bio-Chemistry, of £100, for one year; (k) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (l) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (m) Ethel Boyce Fellowship in Gynaecological Pathology, of £100, for one year; (n) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (o) Rankin Exhibition in Practical Anatomy, of £25, for one year; (p) Lady Jones Research Fellowship in Orthopaedic Surgery, £200; (q) Samuels Memorial Scholarships, three at £20; numerous prizes and medals.

Medical School Buildings.—Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation. All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. A new building for Tropical Medicine has been opened.

Clinical Instruction.—The Clinical School of the University consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of six special hospitals—the Eye and Ear Infirmary, the Hospital for Women (with the Samaritan Hospital), Liverpool Maternity Hospital and Ladies' Charity, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1445 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine is awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination.

The First Examination.—(1) Chemistry and Physics; (2) Biology. Candidates must have attended during at least one year courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, Biology. The candidates sit for these parts separately.

The Second Examination.—(1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry.

The Third Examination.—(1) Pharmacology and Therapeutics; (2) Pathology.

The Final Examination.—(1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynaecology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts. Candidates for the Second Part must complete the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynaecology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at this University:—Scholarships: Dreschfeld Entrance (triennial), £20; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 160 guineas); two Dauntsey Medical Junior, £50 each; Dauntsey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100. Fellowships: Leech Research, £70; Professor Tom Jones Surgical, £105; Morrison Watson in Anatomy, £150; Délépine in Preventive Medicine (biennial), £300; Honorary Research Fellow-

ships. Prizes: Sidney Renshaw in Physiology, £15; Turner Medical, £20; John Henry Agnew in Diseases of Children, £30; Dumville Surgical, £15; Knight Prize in Psychological Medicine, £50; Graduate Prizes, £5 each. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, a lunatic asylum, and a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Clinical Instruction.—MANCHESTER ROYAL INFIRMARY.—The Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 668 patients (including 54 beds at the Central Branch). The medical side consists of five units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anaesthetising, recovery, sterilising, testing and apparatus rooms, and its own class-room attached. All of these units are occupied. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

The number of patients treated during the year 1924 was 10,814 in-patients and 42,348 out-patients; of the latter figure 10,058 were treated in the accident room of the Infirmary. About 9000 operations are performed annually in the operation theatres.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the City, which has now accommodation for 54 patients. The Associated Hospitals thus contain 1230 beds and are under the same management. Women students are admitted on the same terms as men.

Fees.—Medical Practice: Three months, 7½ guineas; six months, 12 guineas; twelve months, 18 guineas; full period required by the Examining Bodies, 60 guineas.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board

of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

Post-Graduate Courses.—Post-graduate Lectures open to all medical men and women are given by members of the staff and others from the last week in September until Christmas, and from the beginning of March until Whit-week. These take place at 4.15 P.M. on Tuesdays and Fridays, and are free. Information can be obtained from the Secretary of the Post-Graduate Committee, Royal Infirmary, Manchester.

The Dean of Clinical Instruction is Dr. T. H. Oliver.

ROYAL MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and Lytham St. Anne's.—The hospital contains 190 beds and 30 in the Convalescent Home, Lytham St. Anne's. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electro-therapeutic Department. Four Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is a new Orthopaedic Department.—A special out-patients' day is held on Tuesday mornings at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 72 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical,

including Mental Disease and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics and Gynaecology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

Clinical Instruction.—THE LEEDS GENERAL INFIRMARY, in connexion with this medical faculty, has accommodation for 630 in-patients, including 88 beds at branch hospitals in the country. During 1924 11,738 in-patients and 50,777 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynaecological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification. Further particulars may be obtained from the General Manager.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates

must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects are Anatomy and Physiology. Candidates must have completed the second year of professional study.

The Third Examination.—The subjects are Pathology, Pharmacology, Anatomy, and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study.

The Final Examination.—The subjects of the examination are:—Part I.—Forensic Medicine and Public Health; Part II.—Medicine (including Mental Diseases and Diseases of Children), Surgery, Obstetrics (including Gynaecology). Candidates for Part I. must have completed the Michaelmas Term of the fifth year of professional study; candidates for Part II. must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology, and Bacteriology.

Scholarships, &c.—At this University, in addition to six Edgar Allen scholarships of £125 a year for three years, holders of which can take the courses in the Faculty of Medicine, there are 11 scholarships tenable in the Faculty of Medicine. Full particulars as to curriculum, scholarships, &c., may be had on application to the Registrar or to the Dean of the Medical Faculty.

The Medical School.—The new buildings of the University opened in 1905 are situated at the west end of the city, adjoining Weston Park, and the Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain refreshments, lunch, dinner, &c., at extremely moderate prices. The University journal, *Floreamus*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road; "Tapton Ciffe," Fulwood-road, and "Endcliffe House," Endcliffe Vale-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained of the tutor for women students. Stephenson Hall is a hall of residence for men students; particulars may be obtained from the Warden.

Clinical Instruction.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes. These are as follows: The ROYAL INFIRMARY (Secretary, Mr. J. W. Barnes), containing 502 beds, with an annual average number of over 5400 in-patients, over 16,000 out-patients, and over 19,000 casualties; the Royal Hospital (Sec., Mr. W. H. Booth), with 316 beds, and an annual number of 3600 in-patients, over 30,000 out-patients, and over 16,000 casualties; and the Jessop Hospital for Diseases of Women, with 91 beds, over 1000 in-patients, and over 2300 out-patients; also a Maternity department, with about 700 in-patients per annum and about 250 out-patient cases attended. Special courses on Fevers are held at the City Fever Hospitals (690 beds) and on Mental Diseases at

the South Yorkshire Asylum (1740 beds). For purposes of clinical practice the practices of the Royal Infirmary and Royal Hospital are amalgamated, giving a total of 818 beds for the treatment of medical, surgical, and special cases. There are special departments for the treatment of Diseases of the Eye at each institution, with wards assigned to them. In addition to these the Royal Infirmary has special departments for the treatment of Diseases of the Skin and Ear, with beds assigned to them, whilst at the Royal Hospital there are special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. Instruction is also given at the South Yorkshire Asylum (1740 beds). The department of Pathology and Bacteriology in the University is fitted with every requirement for the most advanced work in these subjects.

Fees.—The Medical Composition Fee is £38 a year for each of the five years.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Conjoined Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations.

The First Examination.—The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.)

The Second Examination.—The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). Parts I. and II. may be passed separately or together.

The Final Examination.—The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine, and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may be taken together or separately. Forensic Medicine and Toxicology may be taken with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years'

standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynaecology.

Clinical Instruction.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat, and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High Frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

Appointments.—(1) Undergraduate: Clinical clerkships, dresserships, also ophthalmic, obstetric, pathological and ear, nose, and throat clerkships, are tenable at the Bristol Royal Infirmary and the Bristol General Hospital. In these institutions the dressers reside in rotation free of charge. (2) Post-graduate: At the Bristol Royal Infirmary: Four house surgeons, £80 each per annum; two house physicians, £80; two resident obstetric officers, one of whom is also ophthalmic house surgeon, £100 and £80; ear, nose, and throat house surgeon, £80; dental house surgeon, £80. All these appointments are made for six months. From the resident officers a senior resident officer is appointed at a salary of £200. At the Bristol General Hospital: Senior resident medical officer, £250 per annum; casualty house surgeon, £80 per annum; two house physicians, £80 per annum; house surgeon, £80 per annum; special obstetric physician, £80 per annum; house surgeon to special departments, £80 per annum; dental house surgeon, £300 per annum. Appointments are for six months, except that of senior resident medical officer, which is for two years.

Scholarships.—The following are among the scholarships and other awards open to students of the school: The Ashworth Hallett Scholarship, value £45, open to women only; Two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynaecology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Supple Surgical Prize, a gold medal and 7 guineas; the Supple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholar-

ship, value £22 10s., for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14; Lady Haberfield Scholarship, value about 25 guineas; Phyllis Siepmann Prize, for proficiency in Diseases of Children, value £50.

Bristol City Senior Scholarships and those offered by the counties of Gloucestershire, Somerset, Wilts, and Devon, are tenable in the University.

Some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine.

Daily Post-graduate Study.—For those who are able to devote several hours each day to hospital practice the University offers special facilities for Post-graduate work. Qualified medical practitioners may be appointed as Clinical Assistants for a period of one or more months. They may act as Assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Fee, £3 3s. per month.

Post-graduate Clinical Work.—Demonstration courses with weekly lectures are held during May, June, and July. Fee, £2 2s. All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, *inter alia*, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College of South Wales and Monmouthshire there.

University College of South Wales and Monmouthshire, Cardiff. Welsh National School of Medicine.—This School is staffed on the Unit System, and its Courses of Instruction are open to both men and women students. Students can complete the whole of their curriculum in the School. The courses of instruction qualify for degrees in Medicine and Surgery of the University of Wales, and for the Degrees and Diplomas of other examining bodies. Hospital instruction is given at the Cardiff Royal Infirmary, at the City Lodge Hospital, and at other recognised Institutions. The attention of students about to matriculate is drawn to the numerous entrance scholarships offered for competition at the University College, Cardiff, many of which may be held by medical students. Full particulars of the examination for these may be obtained by application to the Registrar. Medical practitioners wishing to prepare for the Diploma in Public Health or for the Tuberculous Diseases Diploma of the University of Wales can attend complete courses of instruction in the School. Prospectuses can be obtained on application to the Dean of the Faculty of Medicine, or to the Secretary, Welsh National School of Medicine.

Clinical Instruction.—CARDIFF ROYAL INFIRMARY: Founded 1837. 450 beds.—There are out-patient departments for Dermatology, Diseases of Children, and Dental Cases, and a Maternity Hospital.—SWANSEA GENERAL AND EYE HOSPITAL: Hospital, 262 beds. Departments: Pathological Laboratory; Venereal Diseases Department; Ophthalmic; Ear, Nose and Throat; Women; X Ray and Massage. Convalescent Home, 26 beds.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

1. *Regulations applying to all candidates who passed the required Preliminary Examination in General Education before Jan. 1st, 1923.*

Professional Examinations.—There are three Examinations, called herein the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral and partly practical. These examinations will be held in the months of January, April, July, and September or October unless otherwise appointed. Every candidate must give notice in writing to Mr. F. G. Hallett, O.B.E., Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, W.C.1, 14 clear days before the day of the examination, transmitting at the same time the required certificates.

The subjects of the *First Examination* are—Chemistry, Physics, and Elementary Biology. A candidate may take this examination in two parts at different times (Chemistry and Physics must be taken together until the required standard is reached in both or in one of these subjects, but a candidate will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other). A candidate will be admitted to examination in Chemistry and Physics, and in Elementary Biology on producing evidence of having passed the required Preliminary Examination and of having received instruction in these subjects at a recognised institution. A candidate rejected in one part or more of the First Examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and he will be re-examined in the subject or subjects in which he has been rejected. If referred in Chemistry, Physics, or Biology he must produce evidence of further instruction at a recognised institution. Any candidate who shall produce satisfactory evidence of having passed an examination for a degree in Medicine in any of the subjects of this examination conducted at a university in the United Kingdom, in India, or in a British colony will be exempt from examination in those subjects.

The fees for admission to the *First Examination* are as follows: For the whole examination, First Admission, £10 10s.; re-examination in Chemistry, £3 3s.; re-examination in Physics, £2 2s.; re-examination in Biology, £3 3s. Second Conjoint: This examination is in two parts—viz.: Part I., Anatomy and Physiology; Part II., *Materia Medica* and Pharmacology. A candidate must have attended at a recognised medical school, lectures on Anatomy, Physiology, and a course of Practical Physiology and Histology, and have dissected for twelve months during the ordinary sessions. He must also attend three months' lectures or demonstrations in Pharmacology and receive instruction in Practical

Pharmacy. Part II. may be passed at the same time as Part I., or before or after that part. The study of Anatomy and Physiology before passing in two of the three subjects of the first examination is not recognised. If rejected, a candidate before being admitted to re-examination must continue his studies at a recognised medical school for not less than three months.

Second Examination: £10 10s.; re-examination in Part I., £6 6s.; re-examination in Part II., £3 3s.

The subjects of the *Third or Final Examination* are: Part I., Medicine, including Medical Anatomy, Pathology, Therapeutics, Forensic Medicine, and Public Health. Part II., Surgery, including Pathology, Surgical Anatomy, and the use of Surgical Appliances. Part III., Midwifery and Diseases Peculiar to Women. Candidates may present themselves for Parts I., II., and III. of the examination separately or together at the expiration of not less than two years (24 months) from the date of passing the Second Examination on production of the certificates of study required for the respective parts, provided that the examination is not completed before the expiration of five years from the date of passing the Preliminary Examination.

The fees for admission to the *Third or Final Examination* are as follows: *Third Examination:* £21; re-examination in Part I., Medicine, £6 6s.; Part II., Surgery, £6 6s.; Part III., Midwifery and Diseases of Women, £4 4s. Members of English, Scotch, or Irish Universities £5 5s. for first admission to the examination and £36 15s. for the diplomas.

A candidate referred on the *Third or Final Examination* will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection and will be required, before being admitted to re-examination, to produce a certificate, in regard to Medicine and Surgery, of having attended the Medical and Surgical Practice, or the Medical or Surgical Practice, as the case may be, during the period of his reference; and in regard to Midwifery and Diseases Peculiar to Women a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognised teacher.

2. *Regulations applicable to candidates who passed the required Preliminary Examination in General Education on or after Jan. 1st, 1923.*

Students are required to pass a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board; a *Pre-Medical Examination* conducted by any of the Qualifying Bodies whose Degrees or Diplomas are registrable on the Medical Register; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education and of having received instruction during 180 hours in Chemistry and 120 hours in Physics to the satisfaction of his teachers. These courses may be commenced or attended before the required Preliminary Examination in General Education is passed. The examination is partly written, partly oral and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of

a period of not less than three months and he must produce evidence of further instruction in the subject or subjects of failure. The fee for the examination is £3 3s., for re-examination in Chemistry £2 2s., and for re-examination in Physics £1 1s.

There are two Professional examinations called the *First and Final Examinations*. The courses of study for these examinations must not be commenced until the *Pre-Medical* examination in Chemistry and Physics or some equivalent examination has been passed.

The subjects of the *First Professional Examination* are: Section I. (a) Anatomy, including Histology and Embryology. (b) Physiology, including Bio-Chemistry. Section II. Pharmacology, Practical Pharmacy and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Bio-Chemistry and Bio-Physics during five terms, courses of instruction in Pharmacology, Practical Pharmacy and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (a) and (b) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the *Final Professional Examination*. The fee for the *First Professional Examination* is £10 10s., for re-examination after rejection in Section I. £6 6s., for re-examination after rejection in either part of Section I. £3 3s., for re-examination after rejection in Section II. £3 3s. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the *Final Professional Examination* are: Section I. (a) Pathology, including Morbid Anatomy, Morbid Histology and Clinical Pathology. (b) Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynaecology. The examination is partly written, partly practical, partly clinical and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the *Final Examination* separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from Section I. The fee for admission to Section I. is £4 4s.; for admission to Section II., Part I., £10 10s.; Part II., £10 10s.; Part III., £6 6s.; and the re-examination fees are respectively £3 3s., £6 6s., £6 6s., and £4 4s.

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the *First and Second Examinations* of the Examining Board, may enter for the *Final Examination* at the expiration of two years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the *First and Second*

Examinations of the Examining Board under the old Regulations, or of the First Examination and Section I. of the Final Examination under the new Regulations may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, and in Laryngology and Otology. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON:

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have passed the examinations for the licence of the College, or else be a registered medical practitioner who has obtained the degree of Doctor or Bachelor of Medicine at a University recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 6 guineas, which is reckoned as part of the fee for admission in the case of success.

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly *viva voce* and include the examination of patients and the performance of operations on the dead body. The First Examination will in future years be held in June and December and the Second Examination in May and November.

The fees for examination are:—First Examination, first admission 8 guineas, and for each re-admission 5 guineas. Second Examination, each admission, 12 guineas. Of such examination fees 20 guineas will be reckoned as part of the fee payable upon admission

to the Fellowship. The fee to be paid upon admission to the Fellowship is 30 guineas, except when the candidate is a Member of the College, in which case the fee is 20 guineas.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First and Second Examinations of the English Conjoint Board, of the equivalent examinations in his University, on the production of certificates of attendance upon prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly. Part I. Chemistry, Chemical Physics; Practical Chemistry; Biology, Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynaecology, and Diseases of New-born Children and the Use of Obstetric Instruments.

The course of study for the Final examination includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of two winter and two summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the offices of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Two years must elapse after a candidate has passed the examination in Anatomy and Physiology before sitting for any part of the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations. The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical student and medical graduate facilities for different forms of instruction and clinical observation. In each case further information can be obtained from the secretary of the hospital.

THE SEAMEN'S HOSPITAL SOCIETY possesses four hospitals—the *Dreadnought* Hospital at Greenwich, 250 beds, and the Branch Hospital in the Royal Victoria and Albert Docks, E., 50 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, 58 beds, London, N.W. 1; Tilbury Hospital, Tilbury Docks, Essex, 52 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds, and the Angas Home, Cudham, 30 beds. Total, 520 beds. It has also a Dispensary in the East India Dock-road from which patients are transferred to the hospitals.

In conjunction with the Fellowship of Medicine arrangements have been made for a course of operative surgery. Secretary: Sir P. J. Michelli, C.M.G.

WEST LONDON HOSPITAL, Hammersmith, W. 6.—This hospital has 210 beds, all of which are constantly in use. 2531 in-patients and 40,629 out-patients, whose attendances numbered 193,941, were treated last year. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men, no junior students being admitted. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynaecology, Medical Electricity, Operative Surgery, Bacteriology, Anaesthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms, &c. The hospital has a fully equipped pathological laboratory at which instruction is given in elementary bacteriology. The fees for hospital practice, including lectures, are £4 4s. for one month, £9 9s. for three months, or £22 1s. for one year. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Sir Henry Simson, at the Hospital. Secretary of the Post-graduate College Mr. C. Cole, and of the Hospital Mr. H. A. Madge.

ROYAL NORTHERN GROUP OF HOSPITALS.—The Royal Northern Hospital, Holloway, London, N. 7, is the main institution of the Royal Northern Group of Hospitals, which includes the Royal Chest Hospital, City-road, E.C., Hospital of Recovery, Southgate, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 394. The Royal Northern Hospital is recognised by the Examining Board in England of the Royal Colleges of Physicians and Surgeons as a place of study during the fifth year of the medical curriculum. Besides the honorary staff there are six anaesthetists, three pathologists, resident medical officer, resident house physician, three resident house surgeons, two resident casualty officers, and one resident obstetric surgeon. The large rectangular and circular wards, each of which contains 25 beds, the children's ward for children under 5 years of age, the observation wards in the new Casualty Department, the two operation theatres, and out-patient department are designed with a view of offering the greatest facilities for clinical work. Special departments include the following: Fracture, genito-urinary and neurological, physio-therapeutic, pathological (under a director of clinical pathology), tuberculosis, and venereal diseases. Patients are removed to the Hospital of Recovery by

ambulance a few days after operation. Medical practitioners are cordially invited to see the general and special practice of the Hospital. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office.

Special Departments.—A new maternity department has been opened, and the light department has been re-equipped.

Post-Graduate Facilities.—In association with the Fellowship of Medicine, two-week "refresher" courses have been arranged for March, July, and November. These will include teaching in general medicine and surgery, and special lectures and demonstrations in special subjects at the Royal Northern and Royal Chest Hospitals.

Further particulars can be obtained from the Secretary of the Medical Committee of the Hospital.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynaecological, and children's wards, having 200 beds. There are special departments for gynaecological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are five resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Dr. C. S. Shanks, Secretary to the Medical Committee, 24, Weymouth-street, W. 1; or from Dr. A. J. Whiting, Dean of the College, 19A, Cavendish-square, W. 1.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. (Established 1873; Incorporated 1917).—The hospital contains 135 beds. The in-patients in 1924 were 1002, and the out-patients and casualties numbered 12,066 new cases. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.30 P.M., Tuesday, 2.30 P.M., Wednesday, 9 A.M. and 1 P.M., Thursday, 8 A.M., Friday, 10 A.M. and 3 P.M., and Saturday, 9 A.M. New Out-patient Departments for special diseases have been opened: Neurology, Diseases of the Stomach and Disorders of Digestion, Diseases of Women, Genito-Urinary Diseases, Diseases of the Rectum, and Dermatology.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—The Hampstead General Hospital (Haverstock-hill) and the North-West London Hospital (formerly at Kentish Town) have been amalgamated since 1907. The Hampstead General Hospital (128 beds—viz., 100 free, 8 isolation and observation, &c., and 20 paying or contributory) accommodates the in-patients from the districts hitherto served by both hospitals. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients' Department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital. Post-graduate work is in connexion with the Fellowship of Medicine.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.; Out-patient Department: 86-90, Newington Causeway, S.E.—This hospital, officered entirely by medical women, is a general hospital for women, girls, and small children of both sexes, and provides accommodation for 113 patients. All diseases are treated with the exception of acute infectious fevers and mental disease. There are Ophthalmic, Urological, X ray and Electrical, Pathological, Physio-Therapeutic, and Dental Departments. The hospital is a centre for the treatment of venereal

diseases under the Public Health (Venereal Diseases) Regulations, 1916. The provision of additional facilities for post-graduate training for medical women is one of the special objects of the hospital. The number of in-patients treated during the year 1924 was 1618. At the Out-patient Department in Newington Causeway 9134 new cases were treated during the past year, the total number of out-patient attendances amounting to 36,193. Clinical assistants (qualified women only) are from time to time appointed in the Out-patient Department. Two resident students act as clinical clerks in the surgical wards. Secretary: Miss M. E. Ridler.

FRENCH HOSPITAL AND DISPENSARY, Shaftesbury-avenue, W.C.—This hospital, which was founded in 1867 to afford medical treatment for poor foreigners who speak the French language, has 74 beds. The Convalescent Home and Retreat for Aged French People at Brighton contains 61 beds. Secretary: Mr. J. Knecht.

ITALIAN HOSPITAL, Queen-square, W.C.—This institution was established in 1884 for the maintenance and medical treatment of Italian and Italian-speaking people, irrespective of their religious and political opinions, who may be suffering from sickness or bodily infirmity, but the sick poor of any nationality are also admitted for treatment. The institution also provides surgical and medical relief to Italians and others not being inmates of the hospital. It has 50 beds.

GERMAN HOSPITAL, Dalston, E. 8.—This hospital was founded in 1845 with the object of supplying medical aid to poor people speaking the German language and for others in cases of emergency and accident. It has 154 beds and a sanatorium with 10 beds; also a Convalescent Home at Hitchin.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Albany Memorial), Queen-square, Bloomsbury, W.C.—The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuro-Pathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist. The hospital has been recognised by the Conjoint Board of England as a place where part of the fifth year may be devoted to clinical work. All communications concerning clinical appointments, lectures, hospital practice, and fees should be addressed to the Secretary.

HOSPITAL FOR EPILEPSY AND PARALYSIS, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. Secretary and General Superintendent: Mr. H. W. Burleigh. The out-patient department is open every week-day except Saturday at 2 P.M.

WEST END HOSPITAL FOR NERVOUS DISEASES.—Out-patient Department, Welbeck-street, W.; In-patient Department, Gloucester Gate, Regent's Park, N.W.; 76 beds, over 48,500 out-patient attendances. Complete reconstruction has recently been effected and the hospital offers all facilities for instruction in Neurological subjects. A series of clinical demonstrations, apart from the general practice of the hospital, is held regularly each session, and the hospital is co-operating with the Fellowship of Medicine in the programme of special post-graduate teaching organised by the Association. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended at the hospital. For further particulars apply to C. C. Worster-Drought,

M.D. (Dean), or to J. P. Wetenhall, B.A., Secretary, 73, Welbeck-street, W. 1.

BETHLEM ROYAL HOSPITAL, St. George's-road, S.E. This hospital is open for the admission of two Resident House Physicians who have recently obtained their diplomas to practise Medicine and Surgery. They are permitted to reside in the hospital for a term generally not exceeding six months, commencing May 1st and Nov. 1st, and are provided with apartments, complete board, attendance, laundry, and a salary at the rate of £100 per annum. They are under the direction of the Physician Superintendent and are elected by the Committee from candidates whose testimonials appear to be most satisfactory. The students of certain specified London Medical Schools receive clinical instruction in the wards of the hospital and qualified practitioners and other students may attend for a period of three months on payment of a fee. A Department for Nervous Diseases has been instituted in a building quite apart from the main hospital. Neurological and early mental cases are dealt with. A Course of Lectures and Practical Instruction for the Diploma in Psychological Medicine granted by the various Universities, will commence in the middle of September. For particulars apply to the Physician Superintendent.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital: terms £1 1s. for one month; three months, £2 2s. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The hospital has been recognised by the Conjoint Board for England as a place where six months of the fifth year may be spent in clinical work. The medical practice of the hospital is also recognised by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students. During the month previous to each conjoint examination the teaching will be as far as possible for students about to enter for the final examination. Dean of the Medical School: Dr. L. S. Burrell, from whom all particulars can be obtained.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. 2.—During the past year 1186 in-patients have been treated in the wards. The out-patients treated during 1924 numbered 8331. Special Departments: Surgical, Laryngological, Radiological, Pathological, Electro-Cardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The In-patient staff visit generally in the afternoon; Out-patients at 2 P.M. The Post-Graduate Association is open to graduates on payment of fee of 1 guinea per annum, which entitles them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, particulars of fees for which can be obtained from the Dean. A club room is also provided. Application for prospectus, &c., should be made to the Dean. Graduates desiring Assistantships in any department should apply to the head of the Department. Physicians to In-patients: E. H. Colbeck, Clive Riviere, A. G. Levy, A. J. Scott-Pinchin, F. G. Chandler, Sir Percy Bassett-Smith; Surgeon: W. H. C. Romanis; Laryngologist: W. G. Howarth; Physicians to Out-patients: J. B. Alexander, J. B. Christopherson, V. S. Hodson; Electro-Cardiographic Department: A. J. Scott-Pinchin; Radiologists: B. J. Leggett, J. V. Sparks; Pathologist: S. R.

Gloyne; Assistant Pathologist: D. S. Page; Dental Surgeon: W. Elder. Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney). Tuberculosis Officers: H. T. Howell and F. W. Hamilton. Other information from the Secretary.

ROYAL CHEST HOSPITAL (for all affections of the heart and lungs), City-road, E.C. (85 beds). Branch of the Royal Northern Hospital, Holloway.—This hospital provides accommodation for 85 in-patients. Expenditure for 1924, £14,598 10s. 8d.; income, £14,168 7s. 11d. The attendance of out-patients 30,000 annually. Secretary: Mr. G. G. Panter.

MOUNT VERNON HOSPITAL (INCORPORATED) FOR TUBERCULOSIS AND DISEASES OF THE LUNGS AND HEART, Northwood; CENTRAL OUT-PATIENT DEPARTMENT, Fitzroy-square, W.—The hospital contains 150 beds, Medical and Surgical; 50 beds reserved for children requiring surgical aid. Number of in-patients, 476; out-patients, 13,889. Resident Medical Staff. Clinical Demonstrations are given by the Visiting Medical Staff at the hospital at Northwood. New departments for artificial light treatment have been opened both in the hospital and the out-patient department. Clinical assistants are appointed to physicians in the wards and in the out-patient department. Secretary: Mr. W. J. Morton.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL (formerly QUEEN CHARLOTTE'S LYING-IN HOSPITAL) AND MIDWIFERY TRAINING SCHOOL, Marylebone-road, N.W.—This hospital receives about 2000 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Antenatal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially trained. A Residential College provides accommodation for five men and two women at a time, students and qualified practitioners, and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council. For further particulars application should be made to Mr. Arthur Watts, Secretary.

HOSPITAL FOR WOMEN, Soho-square, W.—The teaching in connexion with the above hospital has been greatly extended, and is available for Post-Graduates only, in limited numbers. Every facility is afforded them, by the teaching staff, of obtaining experience in diagnosis and treatment of Gynaecological diseases. The hospital contains 68 beds, and the out-patient attendances are over 14,000 per annum. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynaecology, comprising attendance in Out-patient department, operating theatre, clinical lectures, and X ray treatment. For further particulars apply to the Secretary.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W.—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. The fees, payable in advance, are £3 3s. for three months. Full particulars may be obtained on application to the Secretary at the hospital. There are 70 beds. Secretary: Mr. G. H. Hawkins.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Glamis-road, Shadwell, E.—The hospital maintains 136 cots, and on an average 245 out-patients are seen daily. Clinical instruction is given by the physicians and surgeons to the hospital, which is recognised by the Conjoint Board for England as a school of medical teaching for students in the fifth year of the curriculum. All particulars may be obtained on application to the Secretary. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to Mr. W. M. Wilcox, the Secretary.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.1 (contains 244 beds).—The hospital having been recognised by the Conjoint Board for England as a place where, under the new curriculum, six months of the fifth year may be spent in clinical work, the practice is arranged to meet this need and is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to eight medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Fees for hospital practice, one month, 2 guineas; three months, 5 guineas; perpetual ticket, 10 guineas. Clinical Clerks, 1 guinea for one month. Ophthalmological Clerkships.—Clinical Clerks are appointed once a month. Fees £1 1s. for one month's attendance. Pathological Clerkships.—Facilities are afforded for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees: For one month, £3 3s.; for two months, £5 5s.; for three months, £6 6s. A reduction is made in the case of those already holding tickets for general attendance at the hospital. Time so spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, and by the Conjoint Board for England as part of the approved curriculum for students entering for a final examination. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily. Details may be obtained by application to the Dean or Secretary at the hospital. The medical school is a constituent part of the London Post-Graduate Association. Secretary: Mr. James McKay.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark Bridge-road, S.E.—This hospital contains 76 cots and a very extensive Out-patient Department. Clinical assistants (either sex), to work with the Honorary Medical Staff for Out-patients, may be appointed quarterly for a period of three months; there is no salary attached to these posts; but, on the other hand, no fees are charged.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—The hospital contains 130 beds and has a large out-patient department (over 1400 weekly); the home at Broadstairs has 50 beds. Out-patients are seen as under:—Diseases of the Eye: Thursday, 2 P.M. Diseases of the Skin: Monday, 1.30 P.M. Whooping-cough Cases: Friday, 2 P.M. Dental Cases: Tuesday, 1.30 P.M. Medical and Surgical Cases: Mornings at 9.30 and 11.30. Accidents and urgent cases are admitted at any time. Secretary: Mr. D. St. John Bamford.

A Private Nursing Home for Children is now open at 29, Tite-street, in connexion with and adjacent to the hospital. Terms: £1 ls. per day or £5 5s. per week. Application for admission should be made to the Secretary. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is a matter of arrangement between him and the child's parents.

QUEEN'S HOSPITAL FOR CHILDREN (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E. 2. (Telephone 305 and 534 Clissold.) For the sick children of the poor under 14 years of age. Established 1867. 134 beds in London and 36 at the seaside branch, "Little Folks" Home, Bexhill.—During the past year 1627 in-patients and 38,779 out-patients (attendance 145,097) were received. The surgeons attend on Monday, Wednesday, and Friday at 9 A.M., and on Thursday at 1.30 P.M.; the physicians daily at 1.45 P.M., except Saturday, and also Wednesday and Friday, 9.30 A.M., as well as 1.45 P.M. Whooping-cough Physician: Saturday, 9.30 A.M. Skin Physician: Friday, 1.30 P.M. Ear, Nose, and Throat Surgeons: Monday, Tuesday, and Thursday, 9.30 A.M. Eye Surgeon: Wednesday, 1.30 P.M. X ray department open every day. Radiologist attends Monday, Tuesday, Wednesday, and Friday, 2 P.M. Dental department every morning, 9.30, except Saturday; also on Tuesday and Friday, 2 P.M. Massage department daily, morning and afternoon (except Saturday afternoon). The practice of the hospital is open to students by arrangement with the medical staff. Post-Graduate instruction in Children's Diseases, Lectures and Demonstrations at times that will be notified by the Fellowship of Medicine. Applications should be made to the Secretary, Mr. T. Glenton-Kerr.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Clinical Assistants (men or women) are from time to time appointed to the members of the Visiting Staff attending in the Out-patient Department at this hospital, and facilities are given for attendance in the wards.

ALEXANDRA HOSPITAL FOR CHILDREN WITH HIP DISEASE (*late of Queen-square, W.C.*), Kettlewell Home, Swanley, Kent (in connexion with St. Bartholomew's Hospital).—At this hospital cases of hip-disease, spinal caries, and tuberculous diseases of other bones and joints are treated. Students who have obtained a recommendation from their teachers can attend to see the practice. In-patients, Swanley, Kent; Out-patients, St. Bartholomew's Hospital; Fridays, 1.30 P.M. Apply for particulars to the Dean of the Medical College, St. Bartholomew's Hospital, E.C. 1.

ROYAL LONDON OPHTHALMIC HOSPITAL (Moorfields, 1804-1899), City-road, E.C. 138 beds.—This hospital, known as Moorfields Eye Hospital, was moved in 1899 to larger buildings in City-road. Last year there were 2458 in-patients, the out-patients were 49,932, of whom 43,435 were new out-patients, and the attendances were 116,687. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital. Fee for six months, £3 3s.; perpetual, £5 5s. Special courses of instruction, which extend over a period of five months, are given by members of the Surgical Staff; beginning in October and March. A composition fee of 24 guineas (£25 4s.) will entitle students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. A special course is also held in the preliminary subjects (Anatomy, Physiology, and Optics) for the various degrees in Ophthalmology. The fee for this course is 12 guineas. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months. Any further information will be furnished by Mr. A. J. M. Tarrant, Secretary.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, King William-street (next door to Charing Cross Hospital), Strand, W.C. 2.—The hospital contains 42 beds. Out-patients, who number over 14,000 annually, are seen daily at 1 P.M., and operations are performed in the theatre at 3 P.M. The practice of the hospital is open to both men and women practitioners and students. Clinical evenings, at which interesting cases are shown and discussed, are held twice each term at 8 P.M. on the second Tuesday of the month. In addition to the ordinary clinical instruction, a systematic course of Lectures and Practical Classes commences in October and May. Lectures in this course are given daily (except on Saturday) at 4.30 P.M., including all subjects required by candidates for the D.O.M.S., R.C.P. & S. Eng., Part II., and practical instruction is given in Operative Surgery and Ophthalmic Pathology and Bacteriology. A corneal microscope has been purchased and instruction in the Microscopy of the Living Eye can now be obtained. Fees: One month, £1 ls.; three months, £2 2s.; six months, £3 3s.; perpetual, £5 5s.; composition fee for perpetual ticket and attendance at classes (except Operative Surgery and Pathology, for which fee in each case is £2 2s. per course), £10 10s. Students of the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant, and senior or junior clinical assistant. Full details can be obtained on application to the Dean.

ROYAL EYE HOSPITAL, St. George's-circus, Southwark, S.E. 1.—There are 40 beds and 2 cots. In 1924 there were 51,206 attendances in the Out-patient Department, the new patients being 22,218. The daily average of attendances was 173 patients. In-patient admissions numbered 755. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Apparatus has been installed for the Microscopy of the Living Eye. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. Dean: Mr. A. D. Griffith.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on refraction and other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. The out-patient work begins at 1 o'clock, and operations are performed daily between 2 and 4 o'clock. This school is recognised as a teaching institution by the Universities of London and Oxford, and the Conjoint Board of the Royal Colleges of Surgeons and Physicians. The school has also undertaken to receive a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. Secretary: H. R. S. Druce.

WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W.—18 beds. Out-patient attendances, 30,624. Both In-patient and Out-patient Departments of this Hospital are open to medical graduates. Fees £1 ls. per three months. Honorary Secretary: H. W. Burleigh.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, London, W. (founded 1857).—The practice of the hospital, both in the wards and out-patient department, is open daily to post-graduates and others, and will be found valuable by those seeking the higher qualifications—e.g., M.D., M.R.C.P., &c. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the

winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the Cardio-Vascular system, and facilities exist for those requiring practical instruction in Electro-cardiography, X Rays, and other graphic methods. Clinical Assistants in the Out-patient Department are appointed from time to time. For further particulars apply to the Dean of the Medical School (Dr. Parsons-Smith), or to the Secretary, at the hospital.

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. (with which is amalgamated the London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 60,000. Minor operations are performed on Tuesdays, Wednesdays, and Thursdays, at 9.30 A.M. The hospital has been partially closed for some time owing to rebuilding operations. The new wards and in-patient operating theatres are expected to re-open in October. When completed the hospital will contain some 80 beds. Practitioners and medical students are admitted to the practice of the hospital at a fee of £5 5s. for three months, £7 7s. for six months, or £10 10s. for perpetual studentship. From amongst the students junior clinical assistants are appointed periodically. For terms and further information apply to the Dean, Mr. Gilbert Chubb.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.—The practice of the hospital is largely consultative. The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinique. An Intensive Course of Lectures with Operative Surgery Class is given twice yearly—in May and October. Consultations on interesting cases take place on the second Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening Clinics. Full syllabus can be obtained on application to the Dean.

METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL.—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Fee for one month's attendance at the hospital £3 3s., and for three months £5 5s. Clinical Assistants are appointed as vacancies occur, and have responsible duties. Applications should be made to the Secretary, L. L. Phillips.

ROYAL EAR HOSPITAL.—This hospital is now the Ear, Nose and Throat Department of University College Hospital. All out-patient clinics are now held at University College Hospital in Gower-street, but ward visits and operations by the staff take place each afternoon (except Fridays and Saturdays) at Dean-street.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.1. (Founded 1835).—The hospital contains for men and women 54 beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Two

fortnightly courses held during year in coöperation with the Fellowship of Medicine and Post-Graduate Medical Association. Average out-patient attendances, 4000 per year. Average in-patients, 675 per year.

ST. PETER'S HOSPITAL, FOR STONE AND OTHER URINARY DISEASES, Henrietta-street, Covent Garden. Established 1860. New Hospital opened 1882.—The hospital contains 30 beds for men and 2 beds for women and children. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Average beds occupied daily, 30; average out-patients seen daily, 80. Post-graduate Courses of Lectures are arranged through the Fellowship of Medicine from time to time.

LONDON SCHOOL OF DERMATOLOGY, ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.2. In-patient Department (34 beds) at 262, Uxbridge-road, W.12.—Out-patient Clinics are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., from October to March, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology and is open to those who have attended three-quarters of the lectures. The Electrical Department is open daily from 2 to 4 P.M., except on Thursdays and Saturdays. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged. For further particulars and fees apply to the Dean, Dr. A. C. Roxburgh.

LONDON LOCK HOSPITAL AND HOME (Founded 1746).—In the Institution at Harrow-road, W.9, there are 202 beds, and 664 in-patients and 10,958 (attendances) out-patients were dealt with in 1924. In the Male Department and Out-patient Department in Dean-street, Soho, W., there are 40 beds, which during 1924 accommodated 322 patients. 90,881 out-patient attendances were made in the various departments. 3064 injections of substitutes for salvarsan, &c., were made in 1924. Male patients are seen at 91, Dean-street on Mondays and Tuesdays from 1 to 2 P.M., and from 6 to 8 P.M.; on Wednesdays from 6 to 8 P.M.; on Wednesdays at 1 P.M. (female patients); on Thursdays, 1 P.M. (male out-patients), 5 P.M. (female patients); on Fridays from 5 to 7 P.M. (male patients); and on Saturdays from 2 to 4 P.M. (males). Pathological Department, daily at 6.30 P.M. Intravenous injections are given at every clinic. Female clinics are held at 283, Harrow-road, Paddington, on Mondays at 10 A.M., Tuesdays, Wednesdays, and Thursdays at 2 P.M. to 3 P.M., and Saturdays at 2 P.M. The new female out-patient department is open all day long from 9 A.M. to 8 P.M. Irrigations for males are given daily 8 A.M. to 10 P.M. For females Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 11 A.M. to 1 P.M., at 91, Dean-street. The Hospital is linked up with the Fellowship of Medicine, and special courses of lectures are held in February, May, and November each year. Application for tickets should be made direct to the Secretary. Only a limited number of practitioners and students are permitted to attend the Female Lock Hospital, and application should first be made to Major Corbett (Dean) at the Male Lock Hospital; or to the Secretary, Hy. J. Eason, at the Chief Offices, 283, Harrow-road, W.9.

ENGLISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

Under this heading we include all the hospitals which are recognised by the English Royal Colleges for a part of the required attendance on medical and surgical practice, for medical clerkships, and surgical dresserships. The list includes nearly every hospital of a general character in the country having more than 150 beds, though occasionally a large hospital is omitted because equally good opportunities are afforded to students at other institutions in its neighbourhood, while a small hospital may be included because no such facilities for study are present elsewhere. The list is arranged alphabetically as to the town where the hospital is located. Most of the larger general hospitals of the kingdom have already been noticed in connexion with the Universities.

BATH ROYAL UNITED HOSPITAL, Bath.—This hospital contains 206 beds, 72 of which are situated in Combe Park, Bath, and are for *paying patients* only, and possesses X ray, Massage, Bacteriological Departments, a new Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), from 5 to 6.30 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

BEDFORD COUNTY HOSPITAL, Bedford.—This hospital has 109 beds, including 15 beds in the paying wards, X ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, nr. Woburn Sands. The hospital is approved by the University of London for the purposes of the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

BRADFORD ROYAL INFIRMARY, Bradford.—This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynaecological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopaedic cases. Plans for a new hospital of 360 beds have been adopted, and building operations will be commenced as soon as funds will allow.

ROYAL SUSSEX COUNTY HOSPITAL, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynaecological, X ray, and Orthopaedic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

KENT AND CANTERBURY GENERAL HOSPITAL, Canterbury.—The hospital contains 116 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopaedic Department, &c. Secretary, Mr. F. P. Carroll.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry (established 1840).—This hospital contains 241 beds. Special clinics are held for diseases of the Eyes, Ears, Nose and Throat; Gynaecology; X ray and Electrical Treatment. There are also V.D. Clinics. A Pathological Department has recently been started. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

DERBYSHIRE ROYAL INFIRMARY, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892-1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a

separate children's block of 34 beds, and a special department for gynaecological cases. There are four resident house surgeons, a resident house physician, and an assistant house surgeon and casualty officer. There are also well-equipped orthopaedic, X ray, electrical, and venereal diseases departments. Registered medical students are admitted to witness the medical and surgical practice on payment of such fees as the Board may determine.

ROYAL DEVON AND EXETER HOSPITAL, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum, post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. This department is now enlarged to meet the ever-increasing work, and now forms one of the most important sections of the hospital. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

WEST OF ENGLAND EYE INFIRMARY, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1924, 3452. A ward is set aside for newly-born babies suffering from infectious eye diseases. Mothers are accommodated with their babies.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: G. Hurford. In-patients, 1986; out-patients, 10,660. An electrical and massage department has been established and venereal clinic opened. Also ear, nose and throat department, X ray department, dental department, and pathological laboratory.

NORTH STAFFORDSHIRE ROYAL INFIRMARY, Harts-hill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 304 patients, including Children's wards, a Bacteriological and Pathological department, and a department for the treatment of Diseases of the Eye, X Ray and Electrical department, a department for the treatment of Diseases of the Ear, Nose, and Throat, an Orthopaedic department, and Venereal Diseases clinics; so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last six years the sum of £35,000 has been spent on new buildings and alterations. A new Out-patient department, costing £12,000, a new Children's ward of 30 beds, a new Pathological department, and a second large Operation Theatre are amongst the structural improvements already completed. The whole institution is now equipped in a thoroughly up-to-date manner. An Electro-cardiograph has been recently installed. H.M. King George V. laid the foundation-stone of a new Ward block on June 5th. Secretary and House Governor: Mr. W. Stevenson.

HULL ROYAL INFIRMARY, Hull.—This hospital contains 267 beds, and since its establishment in 1782 until the erection of the circular wards in 1907 has undergone steady additions and improvements, including an up-to-date pathological department recently added. A branch convalescent home at Withernsea, with accommodation for 30 patients, is a special feature of the charity.

LEICESTER ROYAL INFIRMARY, Leicester.—Instruction in the Infirmary for medical students is duly recognised by the various examining bodies. At the General Infirmary there are 333 beds, and at the Children's Hospital in connexion 70; venereal diseases, 17; total 420 beds. A reconstruction scheme has been carried out, and £250,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, two new wings, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Open-air balconies on all three floors are a feature. A central sterilising department has been provided. Pathological Laboratories and post-mortem rooms were rebuilt at a cost of £11,000, also an orthopaedic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms, and now provides for 160 nurses and staff. The 150th anniversary of the Institution has recently passed and a sum of £100,000 was raised in commemoration. Funds are being raised for the foundation of a City University, and a splendid site was presented by the late Mr. T. Fielding Johnson, J.P., an ex-chairman of the Royal Infirmary. There are ten resident salaried medical officers at the Infirmary—viz., four house surgeons, two house physicians, two anaesthetists, and two dressers. Most of the posts are filled half-yearly and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. Students are encouraged to make full use of the facilities which exist to gain clinical knowledge in the wards. The hon. medical and surgical staff are willing to afford instruction in a variety of conditions which an active and well-equipped general hospital in a large commercial centre is called upon to treat. A post-graduate course of lectures is arranged annually by the Leicester Medical Association and also clinical classes are held for graduates preparing for the M.D. and M.R.C.P. New accommodation for resident medical officers has been erected. Chairman of the Board: Mr. J. G. Pickard. Deputy Chairman of the Board: Lieut.-Col. C. F. Oliver, D.L., V.D. House Governor and Secretary: Mr. Harry Johnson, from whom information as to prospective vacancies on the Resident Staff may be obtained.

A private hospital has been presented to the City by Mr. Thomas Fielding Johnson, J.P., son of the donor of the University site. This magnificent gift comprises three large dwelling-houses on an admirable site, which have been reconstructed and re-equipped as a private hospital for the reception of paying patients.

NORTHAMPTON GENERAL HOSPITAL, Northampton. Two new wings were opened in 1904 and the old buildings entirely renovated and rearranged. The number of beds is 199. Non-resident pupils receive and have every opportunity of acquiring a practical knowledge of their profession. The fee is £10 10s. Pupils can be received at any time. There is an up-to-date Pathological Laboratory; also X Ray and Therapeutic Department and V.D. Clinic.

NORFOLK AND NORWICH HOSPITAL, Norwich.—This hospital has at present 300 beds. There is a convalescent home at Cromer. Students are admitted to the practice of the hospital for a fee of £5 5s. for six months. Secretary: Mr. Frank Inch.

NOTTINGHAM GENERAL HOSPITAL.—There are at this hospital 317 beds available for medical and surgical patients, and 45 beds are in the detached branch known as "The Cedars" Convalescent Hospital, Woodthorpe. The Medical and Surgical Staffs consist of 2 Honorary Consulting Physicians, 3 Honorary Consulting Surgeons, 1 Honorary Consulting Physician in Venereal Diseases, 3 Honorary Physicians, 4 Honorary Surgeons, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 2 Honorary Aural Surgeons, 1 Honorary Dermatologist, 2 Honorary Anaesthetists, 1 Honorary Surgeon Dentist, 1 Honorary Medical Officer in Charge of X ray and Electro-therapeutic department, and 1 Pathologist. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons, 1 Aural House Surgeon, and 1 Casualty Officer. The special departments are the Ear, Nose and Throat, Skin, Dental, Massage and Exercise, X ray, Orthopaedic, Electro-therapeutic. House Governor and Secretary: Mr. P. M. MacColl.

SOUTH DEVON AND EAST CORNWALL HOSPITAL, Plymouth.—This hospital contains 195 beds (14 of which are for Venereal Diseases in a separate building). There are three Pathological Laboratories, special Departments for X Ray, including Deep Therapy, Ultra-violet Rays, and Electro-therapeutics, and a large Orthopaedic Department. Pensioners are received as in-patients. The hospital is a centre for the treatment of Tropical Diseases. A building with 25 additional beds is in course of erection.

ROYAL HOSPITAL, Portsmouth (founded 1847).—The number of beds is 160. There are X ray and Massage Departments. The hospital is a preparatory school of Medicine and Surgery; the attendance of pupils is recognised by the Examining Boards. Particulars of the Secretary at the hospital.

ROYAL BERKSHIRE HOSPITAL, Reading.—This hospital, which contains 220 beds, was enlarged in 1912, and includes an Out patient Department, a Casualty Department, an X ray Department, Electro-therapeutic and Massage Department, a V.D. clinic, a Laboratory, an Eye Theatre, Eye Wards, and Motor and Horse ambulances. The hospital is approved by the General Nursing Council as a Training School for Nurses. Post-Graduate Lectures are given.

SALISBURY GENERAL INFIRMARY, Salisbury.—This hospital contains 145 beds. The daily average number of in-patients is 127; number of new out-patients, 4266; number of out-patient attendances, 26,116, including 8577 casualties, 1224 medical and surgical out-patients, 736 ear, nose and throat cases, 840 ophthalmic cases, 723 dental cases, 3484 venereal cases, 754 X ray cases, and 6989 massage and electrical cases. Special features: Maternity and antenatal, ophthalmic and private wards; maternity and child welfare clinic. House Governor and Secretary: John S. Birbeck.

ROYAL SALOP INFIRMARY, Shrewsbury.—This hospital has 130 beds. In-patients, 1575; out-patients, 1099; out-patients' attendances, 16,410; accidents and casualties, 2524; dental cases, 386. A site has been purchased adjoining the present Infirmary structure, and it is proposed to erect an annexe for women and children thereon. Secretary: Mr. Alfred Sugden.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, Southampton.—This hospital contains 130 beds. In-patients, 3096; out-patients, 13,199. Secretary: Mr. T. A. Fisher Hall.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford (established 1766).—This hospital has 87 beds. In-patients, 1139; out-patients, 3190. Secretary: Lieut. A. E. Collins.

ROYAL HANTS COUNTY HOSPITAL, Winchester.—This hospital has 158 civilian beds. Secretary: Mr. Herbert Maslen.

WOLVERHAMPTON AND STAFFORDSHIRE HOSPITAL, Wolverhampton.—There are 210 beds. Special departments for Children, Infectious cases, Gynaecology, Ear, Throat, and Nose Diseases, Electrotherapeutic and X ray, Venereal Disease, Pathological Laboratory, Dentistry, and Electro-cardiographic Installation. There is an excellent library. The resident officers are a resident surgical officer, resident medical officer, and two house surgeons. Pupils are allowed to witness the whole of the practice of the hospital and to be present at operations and have every opportunity of acquiring a practical knowledge of their profession. A course of Practical Pharmacy is given by the dispenser. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee. In 1924, 3567 in-patients and 28,290 out-patients were treated; 3721 operations were performed in the theatres.

WORCESTER GENERAL INFIRMARY, Worcester.—This hospital has 132 beds. Pupils are taken by members of the Honorary Medical and Surgical Staff. Number of operations last year 1009. New X ray and Electrical and Wolfram Arc Light, Ear, Nose and Throat, and Orthopaedic Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII., and fire-escape staircases recently erected. In-patients, 1360; out-patients, 4397. Secretary: Mr. E. J. Holland.

YORK COUNTY HOSPITAL, York.—This hospital contains 180 beds. There are balconies for outdoor treatment, two installations of X ray apparatus, electro-therapeutic and massage department, and clinical laboratory. A Venereal Diseases Clinic is held.

SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN (recognised by the UNIVERSITY OF LONDON).—The subjects of the qualifying examination of the Pharmaceutical Society are:—Part 1: (a) Chemistry; (b) Physics; (c) Botany. Part 2: (a) Materia Medica; (b) Pharmacy, including Posology and the Translation and Dispensing of Prescriptions; (c) the law relating to the keeping, selling, and dispensing of poisons and poisonous substances. Fee, 12 guineas; for each subsequent examination after failure, 3 guineas. The advanced or Major examination (for registration as "pharmaceutical chemist") includes botany, chemistry, physics, practical chemistry, and materia medica. Fee, 3 guineas. Courses of instruction are given for Part 2 and for the Major Examination (but not for Part 1). An Intercollegiate, two years' course for the Final examination for the degree of B.Pharm. of the University of London is also given in conjunction with University College. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates in Science may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories. Application for admission to the school, or for further information, may be made to the Dean, Prof. Greenish, 17, Bloomsbury-square, London, W.C. 1.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The degree of Bachelor of Surgery cannot be conferred on any person who does not at the same time obtain the degree of Bachelor of Medicine, and similarly the degree of Bachelor of Medicine is not conferred on any person who does not at the same time obtain the degree of Bachelor of Surgery.

No one is admitted to the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* who has not been engaged in Medical and Surgical study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course of instruction in Clinical and Practical Midwifery and have personally conducted 12 cases of labour.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teacher as may be recognised for the purpose by the University Court.

Women are admitted to graduation in medicine under the same conditions as men.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery is £34 13s., and the proportion of this sum to be paid by a candidate at each division of the examination shall be as follows—viz.: For the First Division of the Examination (Botany, Zoology, Physics, and Chemistry), £9 9s.; for the Second Division (Anatomy and Physiology), £7 7s.; for the Third Division (Pathology and Materia Medica and Therapeutics), £6 6s.; and for the Final Division (Surgery and Clinical Surgery, Medicine and Clinical Medicine, Midwifery, Clinical Midwifery, Clinical Gynaecology, and Forensic Medicine and Public Health), £11 11s.

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted for approval of the Faculty. The fee to be paid for the degree of M.D. is £21, and the fee to be paid for the degree of Ch.M. is £21.

Post-Graduate Instruction.—Courses of instruction are given for the Degrees of B.Sc. and D.Sc. in Public Health and for the University Diplomas in Public Health, Tropical Medicine and Hygiene, and Psychiatry. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University. The University also takes part in the Courses given under the auspices of the Edinburgh Post-Graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be

provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars can be obtained from the Dean of the Medical Faculty.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES. Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that about 1000 students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards.

The practical classes and laboratories will open and the lectures commence on Oct. 14th.

In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school.

Special courses of instruction for dental students are also included in the curriculum of this school.

The minimum cost of the education in this School of Medicine for the Triple Qualification of Physician and Surgeon from the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, including the fees for the Joint Examinations, is about £170, payment of which is distributed over the period of study.

Post-graduate Courses are conducted in conjunction with the University.

Further particulars regarding the school, also its calendar (price 6d.) may be had on application to the Dean of the School, 11, Bristo-place, Edinburgh.

In connexion with the University and Royal Colleges Post-Graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

Clinical Instruction.—**ROYAL INFIRMARY,** Edinburgh.—This hospital has 921 beds and 42 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There are also large and complete Medico-Electrical and X Ray Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology. The fees for hospital attendance are as follows—viz.: Perpetual ticket, in one payment, £12; annual ticket, £6 6s.; six months, £4 4s.; three months, £2 2s.; monthly, £1 1s. Separate payments amounting to £12 12s. entitle the student to a life ticket. The appointments are as follows: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons.

These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department are appointed by the pathologist.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—This hospital contains 120 beds, and is fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily in a building adjoining the hospital. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given from time to time throughout the year by the staff. Students may enter at any time. Post-graduate Courses of Lectures are held during the year. Full particulars can be obtained from the Registrar at the hospital.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for out-door patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Patients whose diseases require operations or more than ordinary care are accommodated in the house. Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A post-graduate course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences on Oct. 13th, 1925. The class meets at 5 P.M. Tuesdays and Fridays, and the instruction, which is practical, is supplemented by lantern demonstrations. Secretary: Mr. J. P. Watson, W.S., 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: M.B. and Ch.B. (always conjointly), M.D. and Ch.M.; B.Sc. in Public Health; D.Sc. in Public Health; B.Sc. in Pharmacy; and Ph.D. in the Faculty of Medicine. A Diploma in Public Health (D.P.H.) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required after registration as a medical student in the books of the General Medical Council. The candidate must, during his curriculum, have attended a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Patho-

logy, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine, and the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising *Materia Medica* and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are higher degrees in Medicine and Surgery respectively, and candidates (not under 24 years of age) who have previously obtained the double bachelorship may be admitted to either M.D. or Ch.M. on completing the after course prescribed, including an examination in Clinical Medicine for M.D. and an examination in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M.

The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject-matter of the thesis.

Fees.—The Fees for M.B. and Ch.B. are £34 13s. The class fee in each subject of the curriculum for M.B. and Ch.B. is £3 3s., £4 4s., or £6 6s., and the present fee for hospital attendance is £7. The fee for M.D. is £21, and for Ch.M. £21.

The great majority of the students take their hospital course at the Western, Royal, and Victoria Infirmary, and at the district hospitals of the Glasgow Parish Council, where clinical instruction is given by professors of the University and others. Clinical instruction on Fevers is given at Ruchill and Belvidere Hospitals, while special courses, largely of a practical nature and embracing work in Hospital or Asylum wards, are conducted by University Lecturers on the Ear, the Throat and Nose, Dermatology, Ophthalmology, Venereal Diseases, Tuberculosis, Insanity, and Electro-diagnosis and Therapeutics. Queen Margaret College, sometime conducted as a separate institution for the higher education of women, was made over to the University in 1892, and in it certain medical classes for women are conducted under lecturers appointed by the University Court.

Post-graduate Medical Teaching.—Organised Post-graduate Medical Teaching is available in Glasgow under the auspices of Glasgow Post-Graduate Medical Association. This Association is representative of practically all the Teaching Institutions in Glasgow, and its business is managed by a Board of which the chairman is Principal Sir Donald MacAlister, and the vice-chairman Sir Hector C. Cameron. Weekly demonstrations for practitioners are given throughout the

winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course, during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. The forenoons are occupied with General Medicine and Surgical Diagnosis and Minor Surgery in the Royal Infirmary and in the Victoria Infirmary. In the afternoons special subjects are dealt with in some of the special hospitals or in the special departments of the general hospitals—two subjects each afternoon. On the four Saturday forenoons Tuberculosis and Infectious Fevers are demonstrated at Ruchill Fever Hospital. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from Dr. James Carslaw, Secretary.

In this University Bursaries and Prizes to the annual amount of over £1000 are appropriated to students in the Medical Faculty, and there are also several Scholarships and Fellowships which may be held by medical students who have gone through the Arts course. A full list will be found in the Calendar.

THE ANDERSON COLLEGE OF MEDICINE, Dumbarton-road, Glasgow, W.—Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Candidates for the Licence in Dental Surgery can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and *Materia Medica*. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

The buildings are situated in Dumbarton-road, immediately to the west of the entrance to the Western Infirmary, and adjoining the University. Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students.

Women students are admitted on the same terms as men, and the Carnegie Trust extends its benefactions to students of the College. Full particulars may be obtained from Sir W. S. McCormick, the Carnegie Trust Offices, Merchants' Hall, Edinburgh.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty, The Anderson College of Medicine, Glasgow, W. Communications relating to the Preliminary Examination in General Education to be addressed to Mr. George C. Pringle, M.A., Educational Institute Office, 47, Moray-place, Edinburgh. Communications relating to the Triple Qualification to be addressed to Mr. Walter Hurst, Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

The Winter Session will open on Oct. 12th, 1925.

ST. MUNGO'S COLLEGE AND GLASGOW ROYAL INFIRMARY.—The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust as regards Scottish birth or extraction, age (16 years), and Preliminary Examination, are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. The classes are open to male and female students equally.

The minimum fees for all the lectures, including hospital attendance, necessary for candidates for the Diplomas of the English or Scotch Colleges of Physicians and Surgeons, amount to £120. Further particulars can be obtained from a syllabus which may be procured free on application to the Secretary of the Medical Faculty, 86, Castle-street, Glasgow.

QUEEN MARGARET COLLEGE (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. They have access to the University Museum and can borrow books from the University Library, besides having a library of reference in Queen Margaret College. The School of Medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. In July, 1894, for the first time in the history of any Scottish University, women students graduated in medicine in Glasgow University; 633 women have now taken the degree of M.B., C.M., or M.B., Ch.B. of the University of Glasgow and 35 the degree of M.D. The women students attend classes in the various University Buildings at Gilmore-hill and Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships. The Winter Session will open on Oct. 12th.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. St. Mungo's College is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, 700 beds. There are special beds and wards for diseases of women, of the throat, nose, and ear, skin, venereal diseases, burns and septic cases. The wards are open to Women Students. At the Out-door Department the attendances numbered over 200,000. In addition to the large medical and surgical departments there are departments for special diseases—viz., diseases of women, of the throat and nose, of the ear, of the eye, of the skin, and of the teeth. Five house physicians and 10 house surgeons, who board in the hospital free of charge, are appointed every six months. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during September in Clinical Medicine, Clinical Surgery, Clinical Gynaecology, Diseases of the Skin, Venereal Disease in the Male, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. For information regarding fees and other particulars, application should be made to the Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital adjoins the University of Glasgow. Number of beds 600. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electro-Therapeutics. The Clinical Courses are given by the physicians and surgeons,

each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological Department the course is both systematic and practical, also post-graduate courses, and extends through the winter and following summer; these are likewise recognised by the University for graduation. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. The fees are as follows:—For Infirmary Attendance: (a) For Perpetual Ticket, £12 12s.; (b) for Single Term Ticket, £1 11s. 6d. For Courses of Instruction: (a) Six Months or Two Terms, £5 5s.; (b) Three Months or One Term, £2 12s. 6d. A Clinical Laboratory has been opened, and students receive laboratory instruction from the lecturer on clinical methods. Secretary: J. Matheson Johnston, C.A., 87, Union-street.

A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics.

ROYAL HOSPITAL FOR SICK CHILDREN, Glasgow.—This institution, which was founded in 1882, consists of: (1) a hospital at Yorkhill containing 270 cots built on an elevated and central site close to the University and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a country branch at Drumchapel, Dumbartonshire, containing 30 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from infectious diseases. In 1924 there were 6050 in-patients treated, and there were 78,585 attendances of out-patients. There are one professorship and two lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, and one lectureship on Surgery and Orthopaedics in Relation to Infancy and Childhood. The Professorship is held by Prof. Leonard Findlay, the Visiting Physician, and the lectureships are held one by Dr. Geoffrey B. Fleming, Assistant Visiting Physician, and the other by one of the Visiting Surgeons, Mr. Alex. MacLennan. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition special facilities are given for post-graduate study. Information with regard to clinical instruction, lectures, and post-graduate study may be obtained from the Medical Superintendent.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL, Rottenrow.—The new hospital, which was opened in 1908, is in point of size the largest of its kind in Britain and has accommodation for 114 patients. A Maternity and Child Welfare Centre has been established in connexion with the hospital, consisting of a complete In-door and Out-door Antenatal Department and an Infant Consultation Clinic. In 1924 4971 normal cases and 2683 abnormal cases were treated by the hospital in the In-door and Out-door Departments. Secretary: Mr. William Guy, 146, Buchanan-street. Full particulars as to fees and accommodation may be obtained from the House Superintendent at the hospital.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, Glasgow.—This hospital, founded in 1886, is the largest purely gynaecological hospital in Great Britain, possessing as it does, 90 beds, which will be increased to 160 when building extensions are completed. It offers excellent facilities for clinical instruction in the diseases peculiar to women, treating in the wards and in the out-patient department from 5000 to 6000 cases per annum. Lectures and clinical

demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for co-ordinating post-graduate medical teaching in all the hospitals. For further information application may be made at the Hospital, or to T. Mason Macquaker, M.A., B.L., Secretary, 149, St. Vincent-street, Glasgow.

GLASGOW LOCK HOSPITAL, 41, Rottenrow, Glasgow. This hospital was founded in 1805 for the treatment of females suffering from Venereal Diseases. It contains 80 beds. There is also a Labour Ward, and a well-equipped Dispensary for out-patient attendances. There is now a Lecture Room and Laboratory, equipped with the most modern appliances, which has been building during the past year, and has just been completed for the accommodation of Students who receive their clinical instruction there. The number of students attending these classes in 1924 was 176; Post-graduate classes are also held. During the course of the past year the hospital has been completely renovated and modernised. In 1924 there were 424 in-patients, and 17,698 attendances were made by out-patients at the Dispensary. The Secretary and Treasurer is Mr. J. Neilson Gray, LL.B., 65, Bath-street, Glasgow.

GLASGOW OPHTHALMIC INSTITUTION, 126, West Regent-street, and 131, Wellington-street (30 beds and six cots).—Clinical and systematic course of lectures for students during the winter and summer sessions. In-patients, 919; out- or dispensary patients, 15,424; daily average of attendances, 147; total attendances, 44,988. Operations on Wednesdays and Fridays. This institution is administered by the Royal Infirmary. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

GLASGOW EYE INFIRMARY, Berkeley-street and Charlotte-street.—This institution, the largest of its kind in Scotland, was founded in 1824. The average number of new patients for the last ten years has been 26,010 and the total number of cases in 1924 was 65,566. The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine, and by the Royal Colleges of Physicians and Surgeons of England for the Diploma in Ophthalmic Medicine and Surgery. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Secretary and Acting Treasurer: Harold John Black, 88, West Regent-street, Glasgow. The medical session opens in October. Post-graduate Classes are being held.

GLASGOW HOSPITAL FOR DISEASES OF THE EAR, NOSE, AND THROAT, 27 and 28, Elmbank-crescent.—15 beds. New patients, 6732. Attendances at out-patient department, 21,550. Admitted to in-door department, 433. Clinical instruction is given in connexion with Dr. Connal's course on Diseases of the Ear at Anderson's College and Dr. Syme's course on Diseases of the Throat and Nose at the Western Medical School. Secretary: D. N. Mackay, 144, St. Vincent-street, Glasgow.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), a Diploma in Public Health, and Diploma in Dental Surgery (L.D.S.).

The Preliminary Examination includes (a) English, (b) Latin, (c) Elementary Mathematics, and (d) one of the following optional subjects: (a) Greek, (b) French, (c) German, (d) Italian, (e) any other approved modern language. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities

shall exempt from the Preliminary Examination. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science and the Final Examination for the Diploma of L.L.A.

Degree of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years after registering as a medical student. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz.: Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, or Institutes of Medicine, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Bacteriology, Practical Chemistry, Physics (including the Dynamics of Solids, Liquids, and Gases, and the Rudiments of Sound, Heat, Light, and Electricity), Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons and is recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine, subject to certain provisions.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynaecology (Systematic and Clinical). The combined fee for tuition and clinical tuition is £182, payable in five annual instalments. Additional fees are required for hospital ticket, midwifery cases, laboratory apparatus.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery shall be 33 guineas, and the proportion of this sum to be paid by a candidate at each division of the examination shall be regulated from time to time by the University

Court. The fee to be paid for the degree of Doctor of Medicine shall be 20 guineas, and for the degree of Master of Surgery 20 guineas. The whole medical curriculum can be taken in University College, Dundee, or the first two years in United College, St. Andrews. For further particulars and details as to scholarships and bursaries application should be made to Prof. Charteris, Dean of the Medical Faculty, University College, Dundee.

UNIVERSITY COLLEGE, Dundee.—This College is one of the constituent colleges of the University of St. Andrews. In the medical buildings there are spacious and well-equipped laboratories. The complete medical curriculum can be taken in Dundee. For classes, fees, &c., see under University of St. Andrews.

ROYAL INFIRMARY, Dundee.—The Infirmary contains 461 beds. In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electro-therapeutics, and Electro-cardiography. An extension providing for new X Ray and Massage Departments and for additional Operation Theatre accommodation has been opened this year at a cost of £25,000. Clinical teaching is given to male and female Students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Boards of the United Kingdom. Nine Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. The fees for Hospital attendance are as follows: For Perpetual Ticket, £12, or if paid in instalments, £12 12s.; Ticket for 12 Months, £4 4s.; Ticket for 3 Months, £1 11s. 6d. Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Medicine (M.B.), and Bachelor of Surgery (Ch.B.). The Degree of Doctor of Philosophy (Ph.D.) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Before commencing his medical studies each student must comply with the following regulations: (1) Every Candidate desiring admission to the Faculty of Medicine must be in possession of the necessary "Certificate of Fitness" issued and attested by the Scottish Universities Entrance Board, 81, North-street, St. Andrews. Forms on which to make application for this Certificate may be obtained from the Secretary to the University of Aberdeen. From and after Jan. 1st, 1921, the Regulations contained in the Ordinances for Degrees in Medicine are revoked, and the following General Regulation made by the Entrance Board is substituted therefor, namely: "That (a) the Group Certificates of the Scottish Education Department, or (b) the evidence of satisfactory completion in Schools in Scotland of a curriculum of Secondary Education, as attested by the said Group Certificates or otherwise, or (c) the Leaving or other Certificates accepted as qualifying for admission to the Universities in the case of applicants for admission from outside Scotland, which shall be deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Medicine, shall be the same as those which, under the Regulations for the time being in force, are deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Arts or, alternatively, in the Faculty of Science, for Degrees in Pure Science."

Candidates, therefore, before entering on the curriculum for the Degree must: (1) have passed (a) the Arts Preliminary Examination, or (b) the Science Preliminary Examination, or (2) hold a qualification recognised as exempting from such examination. (3) Have attained the age of 17 years. (4) That they have passed the Pre-registration Examination in Physics and Chemistry.

Regulations for Pre-registration Courses in Physics and Chemistry have been made by the University in accordance with which the appropriate exemptions can be granted to students.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital; they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

The cost, including Matriculation, Class, Degree, and Hospital Fees, for the whole curriculum leading to the Degrees of M.B. and Ch.B. is approximately £240.

Besides the Royal Infirmary, students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, and Lying-in and Vaccine Institutions, Royal Lunatic Asylum, Ophthalmic Institutions, &c.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis must be presented for approval. The fee is £10 10s.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Application for further information should be addressed to the Secretary of the Medical Faculty.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £30 per annum in value, most of them being tenable for three years. Scholarships: five Post-Graduate Scholarships, value £36 to £160 per annum. Prizes and Medals: 13 Gold Medals and Prizes for proficiency in special departments, &c.

Clinical Instruction is given in the Aberdeen Royal Infirmary (270 beds) by the physicians and surgeons on the staff.

ABERDEEN ROYAL MENTAL HOSPITAL.—Contains, with hospital attached to main institution and agricultural branch, about 950 beds. Clinical instruction is given to students during three months in summer. Clerk and Treasurer, Mr. A. Scott Finnie, 343, Union-street, Aberdeen.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

SCOTTISH CONJOINT BOARD.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three Bodies.

The three Bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery. Copies of the Regulations for the Single Licence of any of the Bodies may be had on application to the respective secretaries.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, three months; Chemistry, six months; Practical or Analytical Chemistry, three months; Anatomy, during at least six months; Practical Anatomy, twelve months; Physiology, six months; Practical Physiology, three months; Materia Medica, three months; Pathology (including Practical Pathology), nine months; Practice of Medicine, six months; Clinical Medicine, nine months; Principles and Practice of Surgery, six months; Clinical Surgery, nine months; Midwifery, three months; Gynaecology, one course of not less than 13 meetings; Diseases of Children, one course of not less than 13 meetings; Medical Jurisprudence and Public Health, three months. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than six months in the wards in each case, and receive practical instruction in administration of anaesthetics. He must attend for six months the practice of a public dispensary especially recognised by any of the above authorities, or the out-patient practice of a recognised general hospital. This attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: Diseases and Injuries of the Eye, three months; Insanity, three months; Infectious Diseases, three months; Gynaecology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Physics, Chemistry, and Elementary Biology.

Second Examination includes Anatomy and Physiology and Histology; and candidates may be admitted to this examination at the end of the second year of medical study.

Third Examination includes Pathology and Materia Medica with Pharmacology.

Final Examination.—The Final examination shall not be taken earlier than the end of the fifth year of study and shall embrace the following subjects:—Medicine, including Therapeutics, Medical Anatomy, and Clinical Medicine; Surgery, including Surgical Anatomy, Clinical Surgery, and Diseases and Injuries of the Eye; Midwifery and Diseases of Women; and, if not passed previously, Medical Jurisprudence and Public Health, but it is optional to candidates who have passed the Third Examination to be admitted to the subject of Medical Jurisprudence and Public Health on lodging certificates of having attended the necessary course in that subject at any time; but the subjects of Medicine, Surgery, and Midwifery shall be taken together at any time after the end of the fifth Winter Session, provided that a period of 24 months has elapsed since passing the Second Examination. All candidates shall be subjected, in addition to the written and oral examinations, to clinical examinations in Medicine and Surgery, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope, Examination of the Urine and Urinary Deposits, Surgical Appliances, Bandages, Surface Markings, &c. The fees payable for the Final Examination shall be— for the whole examination, £15, for re-entry after rejection, £5, and for the subjects of Medical Jurisprudence and Public Health when taken separately, £5, with £3 for re-entry in that subject.

There are four periods of examination annually: During the ensuing period twice in Edinburgh and twice in Glasgow, in 1925-26. The Registrar in Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained.

For students registered with the General Medical Council after Jan. 1st, 1923, more extensive Regulations are in force, and candidates applying for Regulations should state date of registration.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: THE MEMBERSHIP AND FELLOWSHIP.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynaecology, diseases of children, tropical medicine, or medical jurisprudence. The fee for the Membership is £36 15s., 15 guineas of which will be returned to any successful candidate who was already a Licentiate of the College at the time of qualifying for the Membership.

Fellowship.—The Fellows are selected from the ranks of the *Members*. The fee is £64 18s.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH: THE FELLOWSHIP.

The Royal College of Surgeons of Edinburgh also admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of

Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The Royal College of Surgeons of Edinburgh grants a diploma of Fellowship after examination to the holders of the surgical degrees or diplomas of such British examining bodies, as well as of the holders of such surgical degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire as are recognised by the College.

The Fellowship.—Candidates for the examination must be 25 years of age and must have been engaged in practice for at least two years. The examination is of a practical nature, partly written and partly vivâ voce, and must include surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. The fee to be paid on entering for examination for Fellowship is £45, £10 of which is remitted to those who already hold the Licentiate of the College. Candidates rejected at the examination obtain repayment of fee less £10 retained for examination expenses. One month's notice of intention to appear for examination must be given by the candidate to Mr. D. L. Eadie, 49, Lauriston-place, Edinburgh, clerk to the College, together with credentials signed by two Fellows of the College, one of whom must be a resident in Edinburgh, otherwise a special application, with six testimonials, must be made to the President and the Council of the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Like the preceding corporations, the Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held separately.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate of his intention to present himself to Mr. Walter Hurst, the Faculty Hall, 242, St. Vincent-street, Glasgow. The fee for the Fellowship is £50, £10 of which sum is returned to any successful candidate who already holds the Licence of the Faculty. In certain circumstances Fellows may be elected as a mark of distinction.

Licence.—The Licence of the Royal Faculty is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery. The fee is 15 guineas.

SCOTTISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities. In addition the Scottish Boards recognise all the places which are recognised by the English Conjoint Board (see p. 434) and the Irish Conjoint Board (see p. 455).

III.—IRELAND. THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—In order to join the School of Physic students pass a matriculation examination. University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council. The winter courses begin on Oct. 1st.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in June. Courses in preparation for it may be taken in the School of Physic. On passing this examination Medical students should register as such with the General Medical Council.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Lectures—Botany, Zoology, Physics and Practical Physics; Systematic, Descriptive and Applied Anatomy; Chemistry and Practical Chemistry; Histology, Physiology, Practical and Applied Physiology; Practice of Medicine; Midwifery and Gynaecology, Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Surgery and Operative Surgery; (2) three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry; and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Hygiene and Jurisprudence, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynaecology. Part I. may be passed in the fourth year and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing and must produce evidence of having been engaged in the study of Obstetric Medicine

and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. Three months of these courses may be taken concurrently.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Post-graduate Instruction.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 14th, to Saturday, Oct. 3rd. Members of the class can reside in college rooms and dine on commons.

Clinical Instruction.—The hospital facilities for clinical instruction available in Dublin will be described below.

NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students intending to proceed to the medical degree of the University of Ireland must pass a matriculation examination, the examination taking place in June and September in Dublin and at certain local centres. All students must pass in five subjects (three of which must be Irish, English, and mathematics). All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—1. Irish. 2. Latin or Greek. 3. French, German, Italian, Spanish, Portuguese, Welsh, or any other modern language approved by the Senate. 4. English. 5. Mathematics. 6. Latin, Greek, French, German, Welsh, Spanish, Italian, Portuguese, or any other modern language approved by the Senate. History, Geography, Applied Mathematics, or Physics as an alternative, Chemistry, Botany, and for women candidates only, Physiology and Hygiene. Candidates who under the regulations are exempted from the necessity of presenting Irish as one of their subjects, may present as their fifth subject either a second language or a second science subject. Students entering for degrees in Medicine or Dentistry, if already registered by the General Medical Council, may be accepted as matriculated students of the Faculty of Medicine on passing the matriculation examination in any faculty.

The medical degrees granted are:—

M.B., B.Ch., and B.A.O.; and M.D., M.Ch., and M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—The University and the College were created by the Irish University Act, 1908, and by Charters issued in December, 1908. Former students of the Cecilia-street School of Medicine who graduated in the Royal University may become graduate members of the new College. The constitution of the College, like that of the Constituent

Colleges of Cork and Galway, provides for a governing body, an academic council consisting of professors and coöpted lecturers, a body of graduate members, and a body of student members matriculated in the University. The first professors were appointed by the Dublin Commissioners Irish Universities Act, 1908.

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland.

Universities Examinations in Medicine.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination includes Pathology, Medical Jurisprudence and Hygiene, and Materia Medica.

Degrees of M.B., B.Ch., and B.A.O.—The Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year when the curriculum has been completed. The course of study is as follows:—First year.—Winter: Anatomy and Practical Anatomy (required for the Second Examination), Applied Chemistry, Materia Medica and Pharmacology, Applied Anatomy and Physiology, Practical and Applied Physics (with Laboratory Course). Summer: In addition, Applied Biology, Anatomy, and Physiology. Second Year.—Winter: Anatomy, Practical Anatomy, Physiology, and Practical Physiology (physical and chemical). Summer: Anatomy, Practical Anatomy, Physiology, and Practical Histology. Third year.—Winter: Pathology, Surgery, Materia Medica and Pharmacology, Applied Anatomy and Physiology, and Pharmacy. Summer: Materia Medica and Therapeutics, and Practical Pathology. Candidates are also required to attend a General Hospital for nine months (winter and summer). Fourth year, or fourth and fifth years.—Medicine, Medical Jurisprudence and Hygiene, Midwifery and Gynæcology, Operative Surgery, Therapeutics, Applied Anatomy, and Ophthalmology and Otology. Candidates are also required to attend a General Hospital for nine months (winter and summer), to take instruction in Vaccination, and three months Fever Hospital. Fifth year.—If the Academic (Collegiate) Courses are taken as above, the Courses of the fifth year will be the following: Hospital Attendance, General Hospital, nine months; Clinical Ophthalmology and Otology, three months; Practical Midwifery and Gynæcology, six months; Mental Diseases, to be attended at a Lunatic Asylum, three months. (*Note.*—Practical Midwifery and Gynæcology may be taken in the fourth year after the Systematic Course of Midwifery, but it must not be taken concurrently with the period of attendance at Fever Hospital.) Hospital attendance on Diseases of the Skin, Children's Diseases, Diseases of the Ear, Throat and Nose, Venereal Diseases, and instruction in Radiology are also included in the new curriculum. The degree of M.D. may be obtained either by examination or on published work.

Fees.—The fees for Courses may be obtained on application to the Registrar for the College publications. Information concerning these, and the scholarships and exhibitions of the College can be obtained from the Dean of the Faculty, Prof. E. P. McLoughlin.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—The building is provided with a very large, well-ventilated dissecting room supplied with electric light, with physiological, toxicological, pathological and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments

and appliances. There are well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs, the last of these holding a public meeting yearly in the Mardyke grounds.

All students who have been admitted as matriculated students are required to attend before the President and sign the Roll of Matriculated Students. Students who are candidates for degrees in the National University of Ireland must have passed the Matriculation Examination of that University or other recognised examination, and medical students must have passed a preliminary examination recognised by the General Medical Council. For information as to the conditions and courses of the Matriculation Examination application may be made to the Registrar, National University, Dublin.

Admission of Medical Students.—Students in the Faculty of Medicine who have passed the First Professional Examination of the Conjoint Examinations of the Royal College of Physicians and the Royal College of Surgeons in Ireland, or of the Royal College of Physicians and Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Physicians, London, and Royal College of Surgeons, England, may be admitted to the rank of second-year students on making application to the Council and submitting a certificate of having passed the examination. Similarly, students who have passed the Second Professional Examination of the same Colleges may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

Residence of Students.—There is no accommodation for the residence of students within the College, but students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, a list of which can be obtained from the Secretary. All students are required to register their addresses each session in the book kept for that purpose in the hall porter's office, and to notify immediately to the Registrar any change of address during the session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Infirmary, Cork North Charitable Infirmary, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, the Cork Maternity, Fever, the District, and Ear, Eye, and Throat Hospitals.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, Professor A. E. Moore.

*South Charitable Infirmary and County of Cork General Hospital** (100 beds).—Clinical instruction is

given daily in the wards. Special instruction on Diseases of Women and Children will be given in the special wards for such cases. Fee for nine months, £12 12s.; for six months, £8 8s.; for three months, £4 4s. Two resident pupils will be appointed by competitive examination.

Cork North Charitable Infirmary and County and City of Cork General Hospital (112 beds).—Clinical instruction is given daily in the wards by the physicians and surgeons. Special instruction is given to Junior students on two days weekly. Fee for 12 or nine months, £12; for six months, £8; and for three months, £4. Three resident pupils are appointed quarterly by the medical staff. All resident pupils are required to be registered pupils of the hospital. There is a special department for treatment of the eye, ear, throat, and nose, and a special dental department. The hospital contains a fully equipped Pathological Department, and a large and extensive X ray Department has recently been added.

Mercy Hospital.—Clinical hospital recognised by the General Nursing Council for Ireland. This hospital contains 130 beds for medical and surgical cases. There is also a daily extern for medical and surgical cases, as well as for diseases of the eye, ear, and throat. Extern medical and surgical, also eye, ear, and throat attendances for 1924, 29,217; intern patients, 1924, 1664. Daily average, 87. Two resident students. Honorary Secretary to the Staff: Dr. D. J. O'Connor. Special apartments for nurses and nuns under training.

Cork Mental Hospital (Psychological Medicine).—A course of Clinical Lectures on Mental Diseases and Allied Neuroses will be delivered by the Resident Medical Superintendent in the Cork Mental Hospital as soon as possible after the opening of the Trinity Term. The lectures will comprise: Normal Psychology; Psychology of the Insane; Psychoses, Statistics, Classification, Aetiology, Symptomatology, Diagnosis, Prognosis, Pathology and Treatment; Psychoneuroses; Neuroses; Psycho-analysis. The course will be illustrated by typical cases. For further particulars apply to Dr. Owen F. McCarthy, Resident Medical Superintendent.

Victoria Hospital (Incorporated) (Cork).—There are 75 beds. Clinical instruction on Diseases Peculiar to Children is given. The extern department is open daily at 9.30.

County and City of Cork Lying-in Hospital (Erinville, Western-road; founded 1798).—This hospital contains 22 beds, an Extern Midwifery Department, Gynaecological Department, Extern Department for Women, and Child Welfare Centre. Training Centre for Midwives, preparing for C.M.B. examinations. Fee for six months' attendance, including clinical lectures, £5 5s. For further particulars apply to Lucy E. Smith, M.D., secretary to staff.

Cork Maternity (Batchelor's Quay).—Three resident pupils are taken into the Maternity. Poor women are attended at their own homes and there are 8 intern beds. A Child Welfare Centre and Clinic was established in 1919. Clinical lectures are delivered during the session. There is an extern department for the treatment of women's and children's diseases. Fee for attendance at clinical lectures and certificate £5 5s. Honorary secretary to staff (*vacant*).

Cork Fever Hospital.—Upwards of 500 cases of various forms of fever and zymotic disease are treated yearly in this hospital. The Resident Medical Officer gives instruction in Practical Pharmacy, a certificate of which is necessary for the National University and Colleges of Physicians and Surgeons of Edinburgh.

* No returns.

Cork District Hospital* (Douglas-road; 1200 beds). This hospital includes special buildings for fever and other infectious diseases (100 beds); for children's diseases (100 beds); and a Lock hospital, the only one in the South of Ireland (80 beds). It affords an extensive field for the study of all classes of diseases, acute and chronic, including special departments for gynaecology and diseases of the skin and nervous system. The physicians and surgeons visit the hospitals every morning at 10 o'clock. Lectures and clinical instruction are given daily in the wards by the physicians and surgeons. Further particulars may be obtained from Dr. D. Morrissy, 88, South Mall, Cork, honorary secretary, medical staff.

Cork Eye, Ear, and Throat Hospital (Western-road). This hospital is open to students attending the University College and others. Certificates of attendance for three or six months can be obtained. The hospital contains 35 beds. Over 3000 cases are treated during the year. A course of lectures is delivered during the session; also a post-graduate course of instruction. For further information apply to Dr. Arthur Sandford, Eye, Ear and Throat Hospital.

UNIVERSITY COLLEGE, GALWAY: SCHOOL OF MEDICINE.—The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynaecological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, value £20 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value £20 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Tuberculosis Hospital and in the Galway Central and Fever Hospitals, containing on an average 270 patients.

CENTRAL HOSPITAL, GALWAY. 300 beds.—This Hospital has been completely built and in working condition. In addition to the Surgical and Medical Departments there are now available: Eye and Ear, Throat and Nose, Gynaecological and Obstetrical, Pathological, X ray and Electrical and Massage Departments as well. Students attend from University College, Galway. Medical and Surgical Clinics are held on alternate days during term. One Resident Physician and one Resident Surgeon are appointed every six months. Four resident students are appointed every quarter. The Hospital is open to qualified medical men for Post-graduate work.

* No returns.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine by the General Council of Medical Education and Registration of the United Kingdom; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission as a matriculated student of the University shall pass such Matriculation Examination or fulfil such other test of fitness as may be prescribed by the Senate, which may prescribe the conditions under which students who have passed the Matriculation or Entrance Examination of any other University or College approved for that purpose (or who have fulfilled such other test of fitness as may be prescribed) may be exempted from passing the Matriculation Examination of the University. For information as to Scholarships and Prizes inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the First Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for

Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (a) after an examination, which includes written, oral, clinical, and practical examinations; or (b) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The Musgrave Pathological Laboratory. —In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, the diagnosis of cases of infectious diseases, &c. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum.

Royal Victoria Hospital, Belfast (350 beds).—Students eligible for McGrath, McQuitty, Malcolm, Coulter and Smyth Scholarships aggregate annual value £185. Ten House Surgeons and House Physicians. 36 resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students. Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynaecology, Vaccine Therapy, Electrocardiography, Dentistry.

*Mater Infirmorum Hospital** (270 beds).

Belfast Infirmary and Hospital (1600 beds).—Clinical courses are given quarterly, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application, as to classes, to Dr. McLiesh. Certificate of vaccination class recognised by Local Government Board. A new department for Cancer with 32 beds has been opened.

Belfast Hospital for Sick Children, Queen-street.—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards (which contain 45 beds), and in the Out-patient Department, which is largely attended, for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. A Gold Medal is offered for competition at the close of the session. Fee for the session—2 guineas. For re-attendance—1 guinea. Hon. Secretary to the Medical Staff, Dr. Rowland Hill.

Maternity Hospital, Townsend-street, Belfast.—Twenty-five beds in constant occupation, and exclusively devoted to Midwifery and Antenatal conditions. There is also a large district. The Queen's University of Belfast have erected a Students' Hostel in connexion with the Hospital where six Students and Post-graduates are received each month. The University Tutor in Obstetrics resides in the Hostel and Students conduct their cases under his supervision. There is a large Antenatal Department and a Department for Venereal Diseases. The Hon. Secretary of the Medical Staff is T. S. S. Holmes, F.R.C.S.

Ulster Hospital for Children and Women, Templemore-avenue, Belfast (52 beds).—Clinical instruction to students in Diseases of Children, Gynaecology and Obstetrics. Special departments: Radiology, Eye, Ear, and Throat, and V.D. Clinic. Gold Medal awarded annually. One House Surgeon appointed from students of hospital.

Benn Ulster Eye, Ear and Throat Hospital, Incorporated, Clifton-street, Belfast (30 beds).

Belfast Ophthalmic Hospital, Great Victoria-street (30 beds).—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (360 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-Graduate (D.P.H.) Classes are also held. Lecturer: A. Gardner Robb, M.B., D.P.H.

Belfast Mental Hospital (Purdysburn Villa Colony) (1000 beds).

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

* No returns.

The Membership.—Examinations for Membership are held in February, June, and November. The fee for the examination is £21 to Licentiates of the College, or £36 15s. to non-Licentiates.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years. There is a fee of £35 in addition to a stamp duty of £25.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Licence in Surgery.—A candidate whose name is entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Conjoint Board of the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland, preceded by the passing of an Examination in Arts recognised by the General Medical Council, may, at the discretion of the Council, be admitted to the Examination.

Candidates are examined in Surgery, Clinical Surgery, Operative Surgery on the subject, Surgical Appliances, and Ophthalmic Surgery.

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (a) Anatomy, including Dissections; and (b) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars as to fees and conditions of examination can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

This body requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (a) Anatomy, and (b) Physiology and Histology. The second

examination deals with (a) Pathology, (b) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (a) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (b) Surgery, including Operative Surgery; (c) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Fees.—Preliminary Examination, £2 2s.; Re-examination, £2 2s. Pre-Registration Examination, £3 3s. Re-examination in Chemistry, £2 2s.; in Physics, £1 1s. First Professional Examination, £15 15s.; Second, £15 15s.; Final, £6 6s. Re-examination fee is £2 2s. for each division.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (a) Anatomy and Physiology of the Nervous System; (b) Psychology. Part II.: (a) Neurology, including Clinical and Pathological Neurology; (b) Psychological Medicine, including its legal relationships.

Fees.—£3 3s. for each part.

Further information can be obtained from Mr. Alfred Miller, Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

ROYAL COLLEGE OF SURGEONS IN IRELAND (SCHOOLS OF SURGERY).—The schools of surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Barker Prize, £26 5s.; H. Macnaughton-Jones gold medal in Obstetrics and Gynaecology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Hall entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence.

Candidates must pass two Professional Examinations, called the Primary Examination and the Final Examination, which are conducted at separate times, partly in writing, and partly practically and orally. The Primary and Final Professional Examinations are held twice a year—viz., in June and November, or such other dates as may be determined. The Fees payable for each Examination are as follows: Primary Professional, £21; Final Examination, £21.

Candidates who produce satisfactory evidence of having passed an examination for a Degree or Licence in Medicine, conducted by any University in the British Empire, or by the Royal Colleges of Physicians

and Surgeons of Ireland or Great Britain, or by any Foreign University whose Degrees are recognised by the General Medical Council for purposes of Regulation in the Foreign List of the Medical Register, will be exempted from further examination in such subject or subjects of the Primary Examination.

The subjects for Part I. of the Primary Examination are: Anatomy, Physiology and Histology, including Bio-Chemistry; and for Part II., Materia Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (a) Medicine and Clinical Medicine and Clinical Methods. (b) Surgery—Clinical, Ophthalmic and Operative; and Surgical Anatomy. (c) Midwifery and Gynaecology, and Practical Pharmacy and Materia Medica (if not taken at Intermediate Examination).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.¹

SIR PATRICK DUN'S HOSPITAL. Grand Canal-street Dublin.—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Ten Resident Pupils are appointed every four months. Twelve surgical Dressers and twelve Clinical Clerks are appointed each month. There are facilities for women students.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

Fees.—Winter and summer session, £12 12s.; winter session (six months), £8 8s.; and summer session (three months), £5 5s. Special certificate in anaesthetics, £1 1s. The practice of this hospital is open to all students, and the certificates are recognised by Dublin University, the National University and Royal Colleges of Surgeons of England, Ireland, and Scotland.

The Hospital is an official "Treatment Centre" for venereal diseases.

Further information will be supplied by the Hon. Secretary to the Medical Board.

COOMBE LYING-IN HOSPITAL AND GUINNESS DISPENSARY FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. The practice of this hospital is one of the largest in Ireland. Lectures are delivered, practical instruction given, and gynaecological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynaecology is given. There is no extra charge for attendance at this Dispensary. A deep therapy X ray apparatus has been installed for the treatment of malignant cases. There is accommodation for intern pupils who enjoy

exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Lady medical students can reside in the hospital. The residents' quarters are comfortable. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Fees: Extern pupils for full course of six months, £8 8s.; three months, £4 4s. Intern pupils, one month, £4 4s.; each consecutive month, £3 3s.; six months, £18 18s. Registration fee, in advance, 10s. 6d. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

ADELAIDE HOSPITAL, Peter-street, Dublin.—Fee for nine months' hospital attendance, £12 12s.; six months, £8 8s. Summer, three months, £5 5s.² Two resident surgeons are elected half-yearly and four or more resident pupils every four months. At the termination of the session prizes in Clinical Medicine, in Surgery, in Gynaecology, and in Dermatology will be awarded.

Wallace Beatty Memorial bursaries will be awarded at the commencement of the winter session.

Hudson Scholarship.—In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10, together with a silver medal, will be awarded at the end of the session for proficiency in medicine, surgery, gynaecology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from Dr. L. G. Gunn.

JERVIS-STREET HOSPITAL, Dublin.—Founded 1718; rebuilt 1886. 130 beds. The operation theatre contains all modern requirements.

MATER MISERICORDIÆ HOSPITAL, Dublin. (Under the care of the Sisters of Mercy.)—This Hospital was founded in 1861 by the Sisters of Mercy. It is the largest in Ireland, containing 382 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction will be given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery will be taught in the Special Wards and in the Dispensary. Surgical operations will be performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents; a fully-equipped Biochemical Laboratory, a modern Electro-Massage Department, and Electro-cardiograph room. Instruction will be given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 27 resident pupils will be elected annually. Dressers and Clinical Clerks will also be appointed, and certificates will be given to those who perform their duties to the satisfaction of the staff. Leonard Prizes will be offered for competition annually. For further particulars see prospectus. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases; also a Training School and a Home for Trained Nurses in connexion with the Hospital. Trained and experienced Nurses who have passed a qualifying examination in nursing can be obtained on application to the Lady Superior, Mater Misericordiae Hospital.

Terms of attendance.—Nine months, £12 12s.; six winter months, £8 8s.; three summer months, £5 5s. Entries can be made with any of the physicians or surgeons, or with the Registrar, Dr. John O'Donnell, 3, Merrion-square. A prospectus containing in detail the arrangements for Clinical Instruction, Prizes, &c., may be obtained from the Secretary, Medical Board, Mr. H. Barniville, 9, Merrion-square.

¹ This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

² Special Lectures in Dermatology are given weekly; also practical demonstrations on the treatment of fractures from time to time.

MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY. This hospital was founded in 1753 and now contains 150 beds available for clinical teaching. A building containing 40 beds for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months, and two House Surgeons and a Resident Casualty Officer are elected twice annually. Apply to Hon. Secretary and Treasurer of the Medical Board.

MERCER'S HOSPITAL.—This hospital, founded in 1734, is situated in the centre of Dublin, in the immediate vicinity of the Schools of Surgery of the Royal College of Surgeons, the Catholic University School of Medicine, and within five minutes' walk of Trinity College. It contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the posts of Resident Pupil, &c. There is a large dispensary for out-patients and a modern X ray department. An electro-cardiograph has been installed. Students of the hospital are permitted to attend the gynaecological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. A gold medal is awarded annually to the best student. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements.

Appointments.—A House Surgeon is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from amongst deserving members of the class.

Fees.—Winter, six months, £8 8s.; Summer, three months, £5 5s.; nine months, £12 12s.

For further particulars apply to Dr. Bethel Solomons, Hon. Sec., Medical Board, 42, Fitzwilliam-square.

NATIONAL MATERNITY HOSPITAL, Holles-street, Dublin.—Established 1894. The hospital consists of an Intern and Extern Maternity, Gynaecological Wards, and a Dispensary for the treatment of Diseases of Women and Children. During the year 1924-25, 1306 cases were admitted; 791 confinements took place in the hospital, and 349 gynaecological operations were performed. 4436 applied for treatment at the Dispensary. Every facility is given for the carrying out of practical work. Post-graduate and special courses are arranged for at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. **Terms.**—Intern Pupils: Six months, 16 guineas; three months, 9 guineas; two months, 6 guineas; one month, 3 guineas. Extern Pupils: Certified Courses (three months), 6 guineas; Post-graduate Courses by special arrangement. Clinical Lectures are given daily and Oral Lectures four times per week. During the past year over 90 Post-graduate students were admitted. The L.M. Diploma is given by special examination, which is held three times a year. Further particulars can be obtained from the Master, Dr. Patrick McArdle, 27, Merrion-square; or from the Secretary, Holles-street, Dublin.

RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS (HOUSE OF INDUSTRY HOSPITALS), Dublin.*—These hospitals contain 330 beds—130 for Surgical cases, 80 for Medical cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing of 42 beds. A Resident Physician and a Resident Surgeon are appointed each half year and are paid for their services. 20 Resident Clinical Clerks are appointed each quarter and provided with furnished apartments,

* No returns.

fuel, &c. These appointments are open not only to advanced students but also to those who are qualified in Medicine and Surgery. The Dressers are selected from among the best qualified of the pupils without the payment of any additional fee. Women students are eligible for election as residents and special apartments are reserved for their use. For prospectuses apply to Mr. Adams McConnell, F.R.C.S.I., Hon. Secretary, 69, Fitzwilliam-square, Dublin.

ROTUNDA HOSPITAL, Dublin.—This institution is the largest combined gynaecological and maternity hospital in the British Empire. Over 4000 confinements are attended annually and 500 gynaecological patients admitted. Students can take out their necessary gynaecological and midwifery practical courses. The work of the hospital is carried on continuously through the year and consists of daily clinical instruction in the maternity department and examination and operations in the gynaecological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M. and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6s., months other than the first £4 4s., three months £12 12s., six months £21. For further particulars apply to the Master, Dr. Gibbon FitzGibbon.

ROYAL CITY OF DUBLIN HOSPITAL.—Founded 1832; enlarged 1851; rebuilt 1893. 135 beds. There is a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. Secretary: W. H. Leadbeater.

ROYAL VICTORIA EYE AND EAR HOSPITAL, Dublin.—Established 1844. Incorporated 1897. 102 beds. In-patients, 1499; out-patients, 8492.

DR. STEEVENS' HOSPITAL, Dublin (Kingsbridge).—Established 1720. 250 beds, only 150 now in use. Patients, intern, 1300; extern dispensary attendances, including special V.D. Clinic, 38,479. There is accommodation for 12 Resident Pupils, each of whom is provided with a separate bedroom, and board is supplied by the Hospital, at a reasonable rate. All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

ST. VINCENT'S HOSPITAL AND DISPENSARY, Dublin.*—Established 1834. 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Oscope for Senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Farrell gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the Surgeon McArdle Prize, value £20. In the coming term there will be opened a New Extern Department and a New Pathological Laboratory. Dr. Meenan, hon. secretary, 28, Fitzwilliam-square.

* No returns.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

THE LANCET.

LONDON: SATURDAY, AUGUST 29, 1925.

MEDICINE AND THE BUSINESS ASPECT.

THE medical schools throughout the kingdom will be starting the new professional year within the next few weeks, and our present issue, as has been usual at this season, gives a description of these schools, as well as a summary of the curriculum which takes into consideration the various university faculties and corporations entrusted by law with the examination of the students. The number of new students, it would seem, is quite adequate; neither is there any difficulty being experienced in the obtaining of recruits, nor is there now the risk that the medical profession may become overcrowded, as the figures of some five years ago certainly suggested. A dramatic rearrangement of entries, however, is being prophesied from Ireland in response to the action of the Government of the Free State, from whom an unexpected decision has been announced that a separate medical register for the State will be set up. The position was outlined in brief last week, and the suggestion that the move would be unpopular with the medical profession, and especially with the educational authorities in the Free State, has received ample confirmation. From one point of view the action of the Irish Free State is logical. The ideal of the State is independence wherever possible, and the appearance of allegiance to the General Medical Council, whose sessions take place in London, seemed to conflict with the ideal. To those, however, who appreciate the all-embracing hopes of modern medicine, an ideal founded even on such broad grounds as national aspirations will never seem sufficient. There is no possibility of limiting the influence of disease, save in matters of detail, by race or geography, and similarly there is no possibility of adjusting the pattern of medical education or the standards of ethical conduct in accordance with a colour scheme on a map. There is no reason why the Government of the Free State should not be able to evolve an adequate scheme of registration for their country, under which educational facilities are properly coded and bad manners or morals are duly penalised. When this position is reached reciprocity in a certain measure with other countries will follow; but it cannot be reached in a few weeks in response to legislative enactment. Meantime South Irish students may be seeking to obtain their training and their professional qualifications at centres where passing the tests will result in their names being placed on the general Medical Register.

When the schools are formally opened in October the students will in many places be addressed by some person in a position of authority upon the prospects that open out before them. The time has gone by when these introductory addresses were always delivered by a senior member of the teaching staff, and along one line—that of exhortation to the student, who was congratulated upon his choice of a career, to be industrious and enthusiastic in his studies, and to expect to receive material rewards little proportionate to the virtues expended. Such addresses conveyed some truth but concealed one fallacy. Looking

steadily at the noble side of our calling, the orators would omit to take notice of the fact that that calling has also its business aspect, for hardly one of them was ever found mentioning that in the successful conduct of a business life it is as well to understand the relations in which that life stands to the social scheme in general. The matter is brought forward now in the hope that it may inspire some of those who are to address the students at the opening of the forthcoming session to remind the audiences that their professional duties will have always to be conducted with reference to the public; their responsibilities will be immediately towards their patients, but these responsibilities will entail upon them others in which the whole of society is interested. No better illustration of this can be found than a consideration of the necessity for the union of medical men in defence of their conduct when it is assailed, and the student can hardly be told too early in his career that personal insurance against perils of professional life will be a needful protection. In the work of their calling the risk to which doctors may be exposed is frequently exemplified in the lay press, and more particularly in our own columns, and a perusal of the annual reports of the Medical Defence Union and of the London and Counties Medical Protection Society reveals many cases, which have not been made public, where had it not been for the intervention of these societies serious consequences might have resulted for the medical practitioner, as the victim either of ignorance or blackmail. Further, it sometimes happens that a medical man is inequitably dealt with by a public body in whose service he is, and here again the intervention of one of the medical defence societies may save him from injustice, inconvenience, or expense. The past year has afforded striking examples of the dangers to which medical men are subjected in the exercise of their professional duties, the details of which must be fresh in the memory of all. It may be some years before the need will arise for the student of to-day to take advantage of the defence agencies, but the sooner he gets the impression that he will need protection the better.

The necessity to provide for individual defence, however, is but one subject, though an appealing one, of the many that should be brought to the attention of the medical student. All the matters where medicine, which more and more is permeating the general affairs of society, comes into direct contact with local government, and especially with health organisation, are subjects for exposition to those who are in training for our calling. Intensely individual as the practitioner must be in the conduct of his practice as between his patient and himself, in public affairs he has to coördinate his views with those of others who are regarding these affairs in a different way; and his value as a doctor as well as a citizen will be enhanced by his comprehension of the situations in which he will find himself in any intimate dealings with health authorities or the administration of National Insurance. It used to be urged that the medical schools should provide instruction upon the vaguely defined code of mutual good manners called medical ethics. But this medical etiquette was apt to degenerate into a formulary, in which the public interest, though at the bottom of the rules, was not prominently presented to the students. What would be of the greatest value to them is an orderly presentation, especially when their pupillage is drawing to a close, of the position of the doctor in the machinery of society, so that they could appreciate the lines which they must follow when they have to stand up rigidly for the medical view, supporting the attitude in the only proper way—namely, by the arguments proving desire for the public weal.

NAVAL MEDICAL SERVICE.

THE life offered to officers of the Royal Naval Medical Service is one that ought to appeal to a large section of recently qualified medical men. There is no intention in what follows, under this or the subsequent headings, to pit one Service against the other or to recruit in one direction more than in another. The particular regulations for each Service should suffice to give each man the necessary impetus for a decision.

In our notes upon the Service in the Students' Number last year we found it useless to disguise the fact that the attitude of the authorities in respect to the compulsory retirement at the age of 50 of a group of surgeon commanders who were under contract to be employed until the age of 55 had produced an unfortunate impression, and we stated the difficulties created. It is good, therefore, to be able to report that efforts made by the British Medical Association through Sir Richard Luce, M.P., chairman of the Naval and Military Committee, have been successful, and that an increase in the amount paid to senior surgeon commanders on compulsory retirement has been secured. The Admiralty has raised its offer by £50—that is to say, instead of £250, these officers will now be offered £300, on a sliding scale, on their compulsory retirement before the normal expectation under the 1920 regulations. The recompense seems hardly adequate, but as nothing better seems likely to be secured, the Naval and Military Committee of the Association have recommended the acceptance of the offer. Sir Percy Bassett-Smith, the representative of the Service on the Council of the B.M.A., has expressed the view that the relations between the Association and the Admiralty can start again with a clean sheet, the attitude of advising young members of the medical profession to look askance at the chances of a medical career with the Royal Navy being discontinued.

In the Navy the young medical officer sees the world in congenial company and with an assured position, the pay is good, the pensions are commensurate, and the opportunities offered now for scientific work are real, while, if they are taken, promotion awaits the officer on grounds of professional merit.

Rank of Surgeon Lieutenant-Commander will be granted to surgeons at the expiration of six years from date of entry, and the point upon which stress should be laid is that special promotion can be made in cases of conspicuous professional merit, which is thus placed on a par with general service. Six years later the period of promotion to Surgeon Commander is reached, after the qualifying examination has been passed, when again special promotions can be made for conspicuous professional merit as well as for distinguished service; but promotions are limited in number, save, of course, for gallantry in action. This recognition of professional attainment should prove a very real incentive to progressive scientific work. The same principle prevails in the higher ranks. Promotions to Surgeon Captain and later to Surgeon Rear-Admiral are made strictly by selection, but are confined to officers who prove fitted, both professionally and as administrators, for this rank.

Naval life may lead to opportunities for putting into practice much of what has been learned in the clinical wards of a hospital. Further, the opening for preventive medicine is large and many-sided, while appointments to the large shore establishments enable medical officers to keep their work modern.

New chemical explosives, as well as the extraordinary behaviour of common articles under extraordinary conditions of stowage, furnish perpetual problems and surprises for the medical officer on board ship, and bring him into intimate connexion with his charges in a way that is particularly necessary considering the conditions of life. No medical officer can expect to succeed unless he secures the confidence

of those committed to his charge, and the health lectures which he is bound to deliver will be much more fruitful if they are delivered to an audience which trusts him. Moreover, the delivery of official lectures does not end this side of the medical officer's duties. He must be ready to answer questions, sometimes of real acuteness, which are put to him by the modern blue-jacket, and he will find that his lectures will often afford a starting point of work that may develop into great professional interest. Thus, without his being necessarily a psychologist, his influence will be felt by both officers and men, until the well-being of the ship may be profoundly affected by the extent of his tact and skill; for example, small matters assume undue proportion under stress of confinement, and the medical officer should be quick to detect danger signs and warn his commanding officer. Numerous changes have been introduced during the last 20 years into the naval dietary, many of which were the outcome of representations and research by naval medical officers. The work wants carrying on, for much of it has gone to show that the food problem is very complicated. Every medical officer on board ship should make himself acquainted with food values and the human powers of assimilation under varying conditions of work and climate, and here there is ample scope for research. The modern requirements of gunnery and navigation necessitate precision in their use and have made ophthalmology a valuable subject for study in the Navy. The physical training of both officers and men is based on physiological axioms which are peculiarly the field of the medical officer; this training should be the subject of a watchful eye. There is no lack of scope here for professional work without making any reference to the vast problems which have to be faced when the medical officer has to arrange his particular department to the best advantage during or after an action. It is certain that he will not be able to do this unless in times of peace he gets himself ready by study. Lastly, there is the whole field of venereal and tropical disease.

The young medical officer need not be afraid that his work will be without scientific interest if he takes the opportunities offered him.

Conditions of Service.

The rates of pay of the Medical Service are subject to periodical revision in the light of the cost of living, and it is necessary to indicate as closely as practicable the extent and methods of the periodical revision.

In order that students may be under no misapprehension regarding their remuneration should they decide to join the Naval Medical Service, it should be clearly understood that when the pay of naval officers was revised in 1919 it was definitely laid down that 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay was to be considered as due to the high cost of living in 1919, and that it should be subject to change periodically either upwards or downwards according as the cost of living rose or fell. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., and further revisions (not necessarily reductions) are due every three years—i.e., in July, 1927, July, 1930, and so on.

The pay of the Naval Medical Service is shown in two tables, one showing the scale introduced in 1919, which is described as the standard rates and of which 20 per cent. is variable, and the other showing the actual scale in force from July 1st, 1924, to June 30th, 1927.

For the time being the regulations for entry by examination into the permanent service are in abeyance, but a short-service scheme providing for transfer to the permanent service has been inaugurated. The regulations for the entry of surgeon lieutenants under this scheme provide for the usual qualifications of registration, good character, physical fitness, and age—the age not to exceed 30 years. The conditions of service are a three years' engagement with an option of a further year, to serve when and where

required under the general rules of the service as regards discipline, and to rank with, but after, surgeon lieutenants in the permanent service, and to receive two calendar months' notice of services being no longer required.

As from July 1st, 1924, the pay is £1 5s. (standard rate £1 6s. 6d.) per day or £456 5s. (standard rate £483 12s. 6d.) per annum, while there is a gratuity, not subject to variation with the cost of living, on discharge of £8 6s. 8d. for each completed month of service. All officers during service are accommodated and victualled on the usual service scale or receive lodging money and provision allowance in lieu, at rates subject to periodical revision. The present rates of lodging money and provision allowance are £80 and £55 a year respectively. Unlike permanent officers, medical officers entered for short service are not liable to periods of unemployment on unemployed or half pay or eligible for retired pay in respect of service. If, however, such an officer were invalided for a cause certified by the competent naval medical authority as attributable to the conditions of service, he would be eligible for disability retired pay in lieu of the gratuity on discharge referred to above. Similarly, in the event of his death from a cause attributable to the service his widow and children would be treated in the same manner as the widow and children of an officer on the permanent list. There is an equipment allowance for ordinary uniform of £50, but the officer provides himself with a pocket case of instruments and a stethoscope.

A short-service surgeon lieutenant after six months' service, on application to the Secretary of the Admiralty, may be considered for transfer to the permanent service on a satisfactory report being received from the senior medical officer of the Squadron, Hospital or Depot in which he has served or is serving as to his professional ability, and a favourable report from his commanding officer as to conduct. Such candidates must have been under the age of 28 on joining for short service, and officers so transferred will not be eligible for the gratuities provided. They will be permitted to count their seniority from date of entry for short service for purposes of promotion and for increment of full pay, and similarly they will be permitted to count their service from the date of entry for purposes of retired pay, but for purposes of retiring gratuity on the permanent officers' scale their services will be reckoned only from the date of transfer to the permanent list, this date being that of receipt in the ship or establishment in which the officer is serving of the order for his transfer to the permanent list. Until that date he will retain his temporary rate of pay.

If a short-service lieutenant transfers to the permanent service he will then come under the following conditions of pay and pensions:—

Standard and Present Rates of Pay.

Rank.	Standard rate.				Rate from July 1st, 1924.			
	Year of 365 days.		One day.		Year of 365 days.		One day.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Surg.-Lieut. on entry ..	438	0 01	4 0		413	13 41	2 8	
After 3 years ..	529	5 01	9 0		498	16 81	7 4	
Surg. Lieut.-Comdr. on promotion ..	638	15 01	15 0		602	5 01	13 0	
After 3 years ..	675	5 01	17 0		638	15 01	15 0	
Surg.-Comdr. on promotion ..	821	5 02	5 0		775	12 62	2 6	
After 3 years ..	894	5 02	9 0		845	11 82	6 4	
" 6 " ..	967	5 02	13 0		915	10 102	10 2	
" 9 " ..	1040	5 02	17 0		982	9 22	13 10	
Surg.-Capt. on promotion ..	1186	5 03	5 0		1122	7 63	1 6	
After 3 years ..	1277	10 03	10 0		1207	10 103	6 2	
" 6 " ..	1368	15 03	15 0		1292	14 23	10 10	
" 9 " ..	1460	0 04	0 0		1380	18 43	15 8	
Surg. Rear-Admiral ..	1916	5 05	5 0		1809	15 104	19 2	

On first appointment to the service, medical officers will receive full pay from date of appointment, but subject to the provisions of Article 1347 of the King's Regulations.

Officers of the permanent service are eligible during periods of unemployment for unemployed pay and half pay. The rates of unemployed pay and half pay, and the conditions under which they are granted, are the same as in the dental branch and are set forth in detail later in this article.

Flag Allowances.

An allowance of 5s. a day in addition to full pay is granted to the Senior Medical Officer of a flagship bearing the flag of a Commander-in-Chief. An allowance of 2s. 6d. a day is granted to the Senior Medical Officer of a ship bearing other flags or broad pendants.

Standard Rates of Retired Pay.

Compulsory retirement will be as follows:—

(i) Surgeon Rear-Admirals retire at the age of 60 with retired pay at the rate of £900 per annum plus £22 per annum for each year's service over 27 years counting for retired pay, subject to a maximum rate of £1010 per annum. If, however, less than 27 years' service counting towards retired pay is rendered, a deduction of £22 per annum is made for each full year wanting to complete that period, subject to a minimum of £790 per annum.

(ii) Surgeon Captains retire at the age of 55. Maximum retired pay, £900.

(iii) Surgeon Commanders retire at the age of 50. Maximum retired pay, £600.

(iv) Surgeon Lieutenant-Commanders and Lieutenants retire at the age of 45. Maximum retired pay, £450.

Subject to these maxima, the rates of retired pay for Surgeon Captains, Surgeon Commanders, Surgeon Lieutenant-Commanders, and Surgeon Lieutenants are as follows:—

Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)		Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)	
			Addi- tion.	Deduc- tion.				Addi- tion.	Deduc- tion.
	£		£	£		£		£	£
	(p.a.)		(p.a.)	(p.a.)		(p.a.)		(p.a.)	(p.a.)
55	790	24	22	15	47	562	20	15	15
54	765	24	22	15	46	525	20	15	15
53	742	23	22	15	45	487	19	15	15
52	720	23	22	15	44	450	19	15	15
51	697	22	22	15	43	412	18	15	15
50	675	22	15	15	42	375	18	15	15
49	637	21	15	15	41	337	17	15	15
48	600	21	15	15	40	300	17	15	15

(p.a.) = per annum.

(A) Addition for each full year's service in excess of that specified in column 3 or deduction for each full year wanting to complete that period of service—addition or deduction limited to five years in each case.

Twenty per cent. of all the rates of retired pay referred to above is variable with the cost of living, and the rates at present in course of payment are approximately 5½ per cent. below those given above.

DENTAL BRANCH.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of Surgeon Commander (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Entry is by competition, the Competitive Entrance Examination being similar in scope to the Final Qualifying Examination. Candidates are required to produce the usual certificates of birth, registration and of character, and must be physically fit for service anywhere. They must not be more than 28 years of age on the day of commencement of the entrance examination. An outfit allowance of £50 is payable to officers finally entered and commissioned.

Provision has been made for candidates who, at the time of passing the examination, hold or are about

to hold an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list. It is also proposed to allow a three months' Post-graduate Course to Surgeon Lieutenant Commanders (D) of over two years' seniority.

As in the case of the medical branch, 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay introduced in 1919 is considered as due to the high cost of living in 1919 and subject to change periodically either upwards or downwards according as the cost of living rises or falls. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., and further revisions are due every three years—i.e., in July, 1927, July, 1930, and so on. The following table and paragraphs show the standard rates introduced in 1919, of which 20 per cent. is variable and the present rates which will operate from July 1st, 1924, to June 30th, 1927. The rates of full pay are as follows:—

Rank.	Full Pay.		Rate from July 1st, 1924.			
	Standard rate.		Rate from July 1st, 1924.			
	Year of 365 days.	One day.	Year of 365 days.	One day.	Year of 365 days.	One day.
Surg.-Lieut. (D) on entry..	£ 401	s. d. 10 0 1	£ 380	s. d. 4 2 1	£ 401	s. d. 10 0 1
After 3 years ..	492	15 0 1	465	7 6 1	492	15 0 1
Surg. Lieut.-Comdr. (D) on promotion ..	593	2 6 1	559	13 4 1	593	2 6 1
After 3 years ..	629	12 6 1	596	3 4 1	629	12 6 1
" 6 " ..	666	2 6 1	629	12 6 1	666	2 6 1
" 9 " ..	730	0 0 2	690	9 2 1	730	0 0 2
Surg.-Comdr. (D) on promotion ..	775	12 6 2	733	0 10 2	775	12 6 2
After 3 years ..	848	12 6 2	803	0 0 2	848	12 6 2
" 6 " ..	921	12 6 2	869	18 4 2	921	12 6 2
" 9 " ..	994	12 6 2	939	17 6 2	994	12 6 2

On first appointment to the Service, Dental Officers will receive full pay from the date of appointment, but subject to the provisions of Article 1347 of the King's Regulations, 1913.

Dental Officers are eligible for the same rates of lodging and provision allowances as other officers of equivalent rank and are entitled to the same privileges. The rates of half-pay are:—

Unemployed Pay and Half Pay.—A distinction is to be drawn between—

(a) Officers awaiting employment.

(b) Those who are permitted for private reasons which the Admiralty regard as satisfactory to refuse an appointment or to have their appointment cancelled or who are unemployed at their own request or in consequence of misconduct.

In the former case—

(a) Officers are to receive unemployed pay as follows:—
For the first six calendar months full pay of rank (without allowances).

For the next six calendar months:—

Rank.	Standard rate per diem.	Rate per diem from July 1st, 1924.
Surgeon Lieutenants (D) ..	£ 0 17 0	s. d. 0 16 0
Surgeon Lieutenant Commanders (D) ..	1 2 6	1 1 3
Surgeon Commanders (D) ..	1 7 6	1 6 0
Thereafter:—Half the full pay of their rank and seniority on the Executive Officers' scale, namely:—		
Surgeon Lieutenant (D) ..	0 8 6	0 8 0
" of 4 years' seniority ..	0 10 0	0 9 5
Surgeon Lieutenant Commander (D) ..	0 15 0	0 14 2
" of 3 years' seniority ..	0 16 0	0 15 0
" of 6 years' seniority ..	0 17 0	0 16 1
Surgeon Commander (D) ..	1 0 0	0 18 11
" of 3 years' seniority ..	1 2 0	1 0 9
" 6 " ..	1 4 0	1 2 8
" 9 " ..	1 6 0	1 4 7

Unemployed pay will not, however, be granted in cases where an officer is undertaking continuous professional work for which payment is made.

In the latter case, (b), Officers may receive half the full pay of their rank and seniority on the Executive Officers' scale.

Periods during which unemployed Full Pay or Unemployed Pay are received will only count as half-pay time—that is, as one-third of full service.

An Officer who is permitted, for private reasons, to decline an appointment, or to have his appointment cancelled will not be entitled to any Unemployed Pay. In such cases, Officers may be placed on Half-Pay.

The conditions of retirement, Widows' Pensions, Leave, &c., are the same as for medical officers of equivalent rank and seniority.

Arrangements are also made whereby officers may be allowed to withdraw from the Service after four years' service and receive gratuities on the following scale:—

Gratuities will be awarded on retirement and withdrawal on the undermentioned scale.

Rank.	Gratuity.
	£ s. d.
Surgeon Lieutenant (D), Surgeon Lieutenant-Commander (D), and Surgeon Commander (D):	
After 4 years' full-pay service ..	500 0 0
" 8 " " " including ..	1000 0 0
" 12 " " " service ..	1500 0 0
" 16 " " " allowed by paragraph 3 ..	2250 0 0

ARMY MEDICAL SERVICE.

COMPETITIVE examinations for commissions are held twice a year, usually in January and July. The Regulations for admission to the Royal Army Medical Corps should be obtained from the Army Medical Department, War Office, London, S.W. 1, and carefully studied.

The recent alterations in the conditions of service in the Royal Army Medical Corps, which constituted, as we said at the time, the greatest reform that has taken place in that Service for a generation, have fulfilled much of their promise. For many reasons which are obvious and have been detailed on previous occasions, the Service can be recommended to young medical practitioners. But there are things which the man who contemplates joining the Service should bear in mind.

The rates of pay and allowance are good; the chances of seeing the world and the opportunities for post-graduate study are generous, and the work is nowadays varied, responsible, and interesting. At certain periods the officer is relieved from all other duties for five months for the purpose of post-graduate study. During this period he is on full pay and the fees for his courses of instruction are paid by the State. His time is devoted to post-graduate work, and the leading clinical and scientific institutions are co-operating to secure that this post-graduate work shall be real and fruitful. Officers who show a marked aptitude for special subjects and have had previous practical experience in them are now selected to undergo a specialist course lasting for a further four months, thus giving these officers a post-graduate course of nine months. At the same time, in districts where the privilege would be of the most practical value, opportunities are forthcoming for young officers to attend the clinical practice of large local general hospitals.

By a Royal Warrant issued in September, 1919, medical and combatant officers were placed on the same footing as regards retired pay, and the fact that medical officers enter the Service after a long and expensive training some five years later in life than combatant officers was overlooked. This inequality of treatment has since been rectified, with the result that a medical officer of 20 years' service gets approximately £70 per annum more pension than a combatant officer with the same number of years' service.

ROYAL ARMY MEDICAL CORPS: PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Rations†	Servant.	Married.			Unmarried.		Approximate yearly total.	
				Lodging.	Fuel and light†† (average)	Furniture allowance.	Lodging†	Fuel and light (average)	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£	£
Lieutenant	1 0 10	1 8	2 0	3 6	1 7	2 0	2 3	1 4	576	513
Captain	1 5 6	1 8	2 0	4 6	3 3	2 0	3 0	1 9	710	619
Captain, after 6 years ..	1 6 6	1 8	2 0	4 6	3 3	2 0	3 0	1 9	728	637
Captain, after 10 years ..	1 9 4	1 8	2 0	4 6	3 3	2 0	3 0	1 9	780	688
Major	1 13 0	1 8	2 0	4 6	3 3	2 0	4 0	2 6	847	788
Major, after 15 years ..	1 17 10	1 8	2 0	4 6	3 3	2 0	4 0	2 6	935	876
Lieutenant-Colonel ..	2 7 4	1 8	2 0	4 6	3 3	2 0	4 6	2 6	1108	1058
Lt.-Colonel, after 20 years ..	2 9 8	1 8	2 0	4 6	3 3	2 0	4 6	2 6	1151	1101
Lt.-Colonel, after 25 years ..	2 12 0	1 8	2 0	4 6	3 3	2 0	4 6	2 6	1193	1144
Colonel	3 1 6	1 8	2 0	5 6	4 6	2 0	5 6	3 0	1408	1344
Major-General	4 9 10	1 8	4 0	11 0	5 7	2 0	11 0	4 0	2082	2017

* Pay Warrant rates less 5½ per cent. from July 1st, 1924, vide A.O. 93 and 204 of 1924. The Pay Warrant rates when granted were made subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place from July 1st, 1927.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

Dissatisfaction, however, has been expressed on the subject of pensions under the 1919 Warrant for majors retiring after 20 years' service. The matter was brought up at the recent annual meeting of the British Medical Association in Bath, when, on the motion of Sir Richard Luce, speaking on behalf of the Naval and Military Committee, a resolution was carried indicating the strong disapproval on the part of the Association of the treatment of these officers. Sir Richard Luce explained that the pre-war retired pay of a major after 20 years' service was £1 a day, and following the 1919 Warrant the amount was increased to £396 a year, but that reductions made in accordance with the cost of living might bring the pension to less than £1 per diem—that is to say, a smaller sum than was provided by the Warrant under which the officer joined. An additional grievance was that, irrespective of subsequent possible deductions, the increase granted to majors under the 1919 Warrant was proportionately less than most of the pension increases to other ranks. The Secretary of State for War in an interview with the Committee made an offer which might have proved acceptable, but this offer has subsequently been opposed by the Treasury.

The Directorates in Pathology and Hygiene have proved a marked success. The scheme permits specially selected men to rise from all ranks to Major-General on the strength of their scientific work, whereas formerly, whatever a man's qualifications or abilities, on attaining the rank of Lieutenant-Colonel, he went off into administrative work, leaving his scientific duties to his juniors. If he preferred to remain working in bacteriology, in preventive medicine and hygiene, or in tropical diseases, it is true he could do so, but, except in extraordinarily fortunate circumstances for himself, he would find that his devotion to science had cost him all chances of further rise in his Service, promotion being reserved for the administrative billets. This now has all been changed, and the change has its expression in these Directorates. All ranks up to and including the rank of Lieutenant-Colonel can draw specialist pay and hold appointments carrying charge pay. The following is the scale of additional pay and charge pay:—

Additional Pay and Charge Pay for Officers of the R.A.M.C.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by Our Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under, within a limit of 5s. a day:—

Operative Surgery, advanced; Medicine; Ophthalmology; Gynaecology and Midwifery; Dermatology, including Venereal Disease, 5s. daily.

Otology, Laryngology, and Rhinology; Radiology; Anaesthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 2s. 6d. daily.

Officers granted temporary higher rank while holding appointments in the services of hygiene and pathology will not be eligible for additional pay as specialists while holding such temporary rank.

(2) (a) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds ..	2s. 6d. daily.	300 beds ..	7s. 6d. daily.
150 " ..	5s. 0d. "	500 " ..	10s. 0d. "

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

Daily.
s. d.

(b) Senior medical officer, Royal Arsenal not exceeding 10 0

(c) Officer in command of the dépôt, Royal Army Medical Corps 5 0

(d) The senior officer of Our Army Medical Service with an army in the field: A rate to be fixed by Our Army Council according to the magnitude of the charge.

(e) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards 5 0

(f) Adjutant R.A.M.C. Dépôt 5 0

(g) Adjutant R.A.M.C. (Territorial Army) 2 6

Further, an officer, graded as a specialist, and appointed to the charge of a medical or surgical division of a general hospital may be allowed to retain his additional pay and to draw the rate of charge pay laid down for the officer in charge of a medical or surgical division of a general hospital, provided that the total of additional and charge pay so drawn does not exceed the rate of charge pay drawn by the officer in charge of the hospital. With this exception charge pay and additional pay as specialist will not be issuable concurrently. It may be here pointed out that the distinction between scientific and administrative work is largely verbal. Take the conduct of a large hospital—is it possible to separate the scientific routine which is designed to ensure progressive therapeutics from the administrative work which provides and maintains the premises and service, and selects and oversees the personnel?

Under the conditions enumerated the possibilities for good workers is very great in the R.A.M.C.; they will attain to positions of proper trust and emolument by scientific work. This should much improve recruiting among the officers of the R.A.M.C. But there will almost certainly follow arrangements by which all special medical service will receive higher consideration in the Corps. Not only is there in the work of the Army Medical Department scope for original labour and research in tropical disease, in preventive medicine, and in bacteriology, as well as in the vast clinical field open to the specialist

in medicine, surgery, or gynaecology, in venereal disease, in ophthalmology, and so on, but it is proposed to develop a scheme whereby child welfare shall be undertaken systematically by the R.A.M.C. A scheme of this sort is already running successfully at Aldershot, and we see in this direction a fine opening for preventive medicine, and one which should bring the officers of the R.A.M.C. into touch with the soldiers in a valuable and intimate manner.

The above schemes for the stimulation of purely professional work among officers of the Corps must not be taken to imply that instruction in administrative work has been overlooked. One of the lessons of the war was that good administration must exist for the fullest benefit to be obtained from the professional talent available. The necessity of training officers who may display capacity for organisation and administration has not been lost sight of, and there are many appointments of varying degrees of importance and responsibility open to officers who desire to take up this side of the Corps' duties.

Retirement and Retired Pay.

The following are the rates of pension and retired pay:—

1. Retired pay will consist of two parts: (a) a service element based on the officer's total service; (b) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible for retired pay.

2. The scale will be as follows, subject to the reduction of 5½ per cent. referred to below:—

(a) Service element.—£15 a year for each completed year of service as a medical officer.
(b) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant-Colonel	150	30	240
Colonel	290	50	390
Major-General	440	50	540
Lieutenant-General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (a) and (b) together:—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General ..	1200

The above rates are those laid down in the Pay Warrant. They have been reduced by 5½ per cent. as from July 1st, 1924. (See footnote,* p. 463, and A.O. 205/24.)

3. Officers with 8½ and less than 20 years' service as medical officers may be permitted to retire with a gratuity varying from £1000 to £2500.

Arrangements have been made for the appointment of Consultants in both Medicine and Surgery and the ranks of Colonel and Major-General will now be open to such Officers. The duties of these Officers are to visit all Commands and advise the Director-General, as the result of their inspections on the spot, with regard to the professional work being carried on in the hospitals, and the degree of efficiency attained by the personnel with whom they are respectively concerned. This should ensure a high standard of performance if only because of the satisfactory feeling that good work will not by accident remain unnoticed.

The present holders of these posts are Consultant in Surgery, Colonel J. W. West, late Professor of Surgery at the Royal Army Medical College; Consultant in Medicine, Colonel J. C. Kennedy, late Professor of Tropical Medicine at the Royal Army Medical College.

THE ARMY DENTAL CORPS.

The Corps is administered by the Director-General, Army Medical Services. It is a joint service for the Army and Royal Air Force and personnel is required to serve under either force and be interchangeable.

Officers and other ranks posted for duty with the Royal Air Force will perform their duties under the Regulations of the Royal Air Force for the employment of dental personnel, but the conditions in the following tables apply equally in either force. Promotion is carried out on one general list. The regulations for admission to the Army Dental Corps should be obtained from the Secretary, War Office, and carefully studied.

OFFICERS: Appointment and Promotion.

1. Commissions as lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer shall be eligible for promotion to the rank of captain on completion of three and a half years' service in the Corps provided he has previously qualified in such manner as may be prescribed by the Army Council.

3. Promotion to the rank of major and lieutenant-colonel to fill the establishments laid down from time to time for those ranks, shall be made by selection of the Army Council, provided the officer has previously qualified for promotion to those ranks in such manner as may be prescribed by the Army Council.

4. Certain appointments in the rank of lieutenant-colonel and major have been approved to fill the establishment. The remainder of the appointments are in the rank of lieutenant, except in cases where service of three and a half years or more has been given as a temporary dental officer when the rank of captain will be given. Service as a temporary dental officer will count towards the three and a half years for promotion to captain.

Pay.

The following are the rates for officers of the Army Dental Corps:—

	Per diem.
	£ s. d.
Lieutenant	0 18 10
Captain	1 3 8
Captain {after 6 years' total service ..	1 5 0
„ 10 „ „ „ ..	1 7 0
Major	1 11 2
Major, after 15 years' total service ..	1 15 10
Lieut.-Colonel	2 4 10
Lieut.-Colonel {after 20 years' total service ..	2 7 4
„ 25 „ „ „ ..	2 9 8

These rates are 5½ per cent. below those shown in the Pay Warrant, 1922. The latter, when granted, were made subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place on July 1st, 1927.

Allowances.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the R.A.M.C.

Retirement and Retired Pay or Gratuity.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed:—

After 8½ years' service in the Corps, gratuity of £1000.
„ 15 „ „ „ £1800.
„ 18 „ „ „ £2500.

(4) Retirement will be compulsory at the age of 55 years.

(5) A lieutenant who does not qualify for promotion within three and a half years' service in the Corps will be retired; and a captain who fails to qualify for promotion to major within twelve years' service in the Corps will be retired on any gratuity for which he may be eligible under paragraph 3.

Other Ranks.

The rates of pay of warrant officers, non-commissioned officers and men are those provided in the Warrant of Sept. 13th, 1919, *vide* A.O. 325/19.

The aim of the Corps is the prevention of wastage of man power on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier will be re-inspected at least once a year and his dental efficiency maintained at the best standard possible. As recruits are not now enlisted unless they have sufficient natural teeth to enable them to masticate efficiently it is hoped that the conserva-

tive nature of the treatment they will receive will reduce considerably the percentage of artificial dentures required.

The "other ranks" of the Corps consist of dental mechanics and clerk orderlies. Training of dental mechanics has been proceeding for some time at the Central Dental Laboratory, Aldershot, and it is not proposed to open recruiting at present for this section. A limited number of clerk-orderlies is now being enlisted, and these men receive their training at the Royal Army Medical Corps Dépôt.

INDIAN MEDICAL SERVICE.

WE cannot yet foretell how and to what extent the Indian Medical Service will be affected by the report of the Royal Commission on the Superior Civil Services in India. The report is the outcome of the Indian reform scheme, the essence of which is an increasing participation by Indians in the government of the country, and as far as the Indian Medical Service is concerned, the recommendations of the Commission can be summarised with fair accuracy.

Contrary to the recommendation of the Verney-Lovett Committee, the Commission has recognised that the medical needs of both the British and Indian armies in India should be provided for in future by the Royal Army Medical Corps (India) which should absorb the Indian Medical Service, no attempt being made to perpetuate that service as at present constituted. This recommendation is in accordance with the scheme elaborated by Sir Charles Burtchell in 1919, and printed at length as an appendix to the Commission's report. At the same time, a new civil medical service is to be constituted in each province recruited by competitive examinations held both in England and India. To meet the medical needs of British officers in the Civil Service and their families a minimum number of British officers is to be maintained in this civil medical service, the limit to be prescribed for each province by the Secretary of State, on whom in the last resort is to rest the responsibility for their maintenance. Of this British element, one half, or the number required for the military reserve (whichever is the larger), is to be earmarked for British officers seconded from the R.A.M.C., the remainder being those succeeding in competitive examination. It is further recommended that, subject to the existing rights of present members of the Indian Medical Service, all scientific chairs in Government colleges and hospitals shall be thrown open to all candidates, the clinical chairs alone being reserved for members of the civil medical services so far as suitable candidates are available.

Whatever the ultimate arrangements may be, the necessity will remain to provide a European medical service in India so long as Europeans are employed in the various departments of the Civil Service.

It would be idle to pretend that the I.M.S. is in a happy plight at the present time. The announcement of terms for special recruitment which was published in THE LANCET of March 14th this year showed not only that the future is unsettled, but also, by implication at any rate, that the ordinary methods of replenishing the cadre by the medium of competitive examination have failed. Complete grounds on which to form a definite estimate of the attractions of the service are lacking, but even in the present state of flux we must consider here the past and present conditions, and try to come to some such provisional conclusion with regard to the future as may help to guide possible candidates in deciding whether to apply or not when vacancies are again advertised.

There is, of course, a general feeling of malaise and uncertainty, not only in the I.M.S., but in other Indian services, though there are causes of dissatisfaction special to the I.M.S. Together with the I.C.S., the police, and other departments, the officers of the I.M.S. suffer from increased cost of living, the diminu-

tion of social amenities in the smaller stations which are rapidly becoming Indianised, and restricted opportunities for sport. There is also, in many cases, a feeling of not being wanted, and in some districts the attitude, even of the rural population, is neither so helpful nor so friendly as it was. With the contraction of the cadre consequent on the reduction in the number of the posts reserved for the I.M.S., more time will necessarily elapse before men can hope to get into civil employ. Then, with the increase of Indian private practitioners, some of whom have obtained the highest British qualifications, opportunities for private work are diminishing, while there will be with many a reluctance to serve under Indian superiors.

It has thus to be admitted that in many ways the conditions of service have considerably deteriorated, but there is another side to the picture, and the changes are by no means all on the debit side. While various general considerations affect the service—like the other services, the work is of a highly technical nature, so that the executive cannot be much subject to interference, whether from European or Indian superiors, and the social effect of Indianisation will be less, for the reason that European I.M.S. officers will no doubt be mostly utilised for stations with considerable European communities. Thus adverse popular sentiment should affect the I.M.S. but slightly, and there will be little change in the work, while the alterations should be largely for the better with the progressive improvements in the equipment and organisation of hospitals. There are not so many efficient surgeons in the provinces that good men, whether European or Indian, will not make their presence felt and appreciated, and the fewer Europeans of the right type that are available the more useful their work will be individually to the country, and the more profitable to themselves. The opportunities for professional work have always been the main inducement to ambitious British medical men to take up appointments in India, and those opportunities remain as attractive as ever, except in the teaching institutions, where the indications unfortunately are that fewer posts will in future be available for officers of the I.M.S., either European or Indian.

Against the undue delay in getting civil employ, again, has to be balanced the fact that when civil posts are obtained they will be better than any man could ordinarily have expected under the former conditions, immediately after entry into the civil department. Many of the smaller and less desirable stations will have disappeared from the I.M.S. list, and in general those which remain will be not only more desirable but more remunerative. It has to be admitted, though, that the time for the accumulation of large fortunes in private practice has for the most part passed.

As regards emoluments, no doubt expenses have increased, but some years ago an all-round increment of about 50 per cent. was granted, and the concessions under the recommendations of the Lee Commission will be by no means negligible. They include, amongst other things, a reasonable number of free passages for both the officer and, if married, his family, and a considerable addition to cash receipts in the form of facilities for remission home at a specially favourable rate of exchange.

Especially with regard to the military appointments there is much to be put to the credit side in the changes which have occurred of recent years. The station hospital system, for instance, has not only rendered the position of the medical officer much more independent, but it has made team work possible, increased the opportunities for professional activity in every direction, enabling men to specialise in various departments of medicine and surgery. In both military and civil departments, again, improved travelling regulations, introduced a few years ago, have removed one very great hardship. For under the old rules transfers nearly always implied a serious loss; nowadays they are carried out under much more reasonable conditions.

It will be seen from the regulations for special recruitment, and other indications, that the future of the I.M.S. is still hanging in the balance. In any case, however, the interests of suitable men joining at the present time would presumably be properly safeguarded, and reasonable security of tenure granted, with some short-term gratuity system (such as that recently offered) and proportionate pensions to fall back upon in case of need and after a certain time of service. It appears that even in the present circumstances the service offers considerable attractions.

AIR FORCE MEDICAL SERVICE.

THE Royal Air Force Medical Service offers a career for medical men which should prove both attractive and interesting. The rates of pay and allowances are good, and a new field of scientific interest is opened up by the manifold problems which the circumstances of aviation produce. The physical and mental fitness for, and reaction to, the varied conditions under which the flying personnel perform their functions provide much scope for research. As promotion to the higher ranks of the Service is by selection from officers who are eligible by reason of length of service, and as a certain proportion of the higher ranks will be reserved for purely scientific, as opposed to administrative, appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in scientific research, as well as for those who develop a talent for administration.

The establishment will consist partly of permanent and partly of short-service officers. An officer will on first entry be granted a short-service commission for a period of three years on the active list (which may be extended to five years at the discretion of the Air Council on the recommendation of the Director of Medical Services), and of four years in the Reserve of Air Force officers. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

Short-service officers who are approved for permanent commissions, but for whom there are not vacancies in the Royal Air Force Medical Service, may, under certain conditions, be considered for transfer to the Royal Army Medical Corps, counting their time served in the Royal Air Force towards increments of pay and retired pay in the Royal Army Medical Corps.

Officers who have been selected for permanent commissions may be permitted to attend for a period not exceeding nine months a post-graduate course in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such permission may be granted during the first six years of permanent service, and when attending these courses officers will receive full pay and allowances.

New entrants for the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will normally be promoted to the rank of Squadron Leader after 10 years' total service. Accelerated promotion may be carried out, in a limited number of cases, of officers who show exceptional ability after the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and to that of Group Captain by selection at any period after 22 years' service.

There will be no competitive examination on entry; candidates must be under 28 years of age, British subjects, the sons of British subjects, and of pure European descent, be nominated by the Dean of a recognised medical school or teaching hospital, and

will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce—

1. Birth certificate.
2. Medical registration certificate.
3. A declaration containing the following information:—
 - (a) Age and place of birth.
 - (b) That he is a British subject and the son of British subjects, and of pure European descent.
 - (c) That he is ready to engage for general service at home or abroad as required.
 - (d) The qualifications he is possessed of, and what medical or other appointments he has held (if any).
 - (e) That he is willing to fly whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

An officer granted a short-service commission who, at the time of application for such commission held or was about to hold a resident appointment in a recognised civil hospital, may be seconded for the period not exceeding one year from the date of the commission during which he shall hold such appointment. Whilst seconded he will not receive pay from Air Ministry funds, but the period of secondment will otherwise count as service in the Royal Air Force, provided that he will be required to serve for a minimum period of three years on the active list from the date on which he ceases to be so seconded.

Uniform and Equipment.

Medical officers will be required to provide themselves with the uniform of their rank and with the distinguishing badge of the Royal Air Force Medical Service. They will be required to provide themselves with service dress and mess dress. The provision of full dress is entirely optional at present.

An allowance towards the cost of uniform will be made when the officer has been gazetted, as follows:—

(a) If he has had no previous service as an officer in H.M. Forces or if any such previous service was terminated more than three years before the date of joining for duty, £50.

(b) If he is commissioned within three years of the termination of any previous service as an officer in the Royal Navy, Army, Indian Army, or Royal Marines or any of the auxiliaries of those forces, but not in the Royal Air Force or its auxiliaries, £25.

(c) If he is seconded from the Royal Navy, Army, Indian Army, or Royal Marines, £25.

The rates of pay and allowances at present in force are as shown in Table I.

The standard scale of retired pay for Group Captains and lower ranks is given in Table II.

TABLE II.

Age on retirement.	Standard yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
40	£ 300	17	£ 15	£ 15
41	337	17	15	15
42	375	18	15	15
43	412	18	15	15
44	450	19	15	15
45	487	19	15	15
46	525	20	15	15
47	562	20	15	15
48	600	21	15	15
49	637	21	15	15
50	675	22	15	15
51	697	22	22	15
52	720	23	22	15
53	742	23	22	15
54	765	24	22	15
55	790	24	22	15

* Limited to five years.

Group Captains retire at 55; maximum retired pay £900.
Wing Commanders retire at 51; maximum retired pay £800.
Squadron Leaders retire at 48; maximum retired pay £500.

TABLE I.—AIR FORCE MEDICAL SERVICE: RATES OF PAY AND ALLOWANCES.

1. The following is an outline of the emoluments issuable to officers of the Medical Branch of the Royal Air Force at present. Allowances are issued only when accommodation, fuel, light, rations and personal attendance are not available and the rates vary in different countries.

	Pay.				Allowances (daily rates at home).						Total allowances at home.				Total emoluments at home.					
	Daily.		Yearly.		Lodging.	Fuel and light (average).		Ration.		Servant.	Daily.		Yearly.		Daily.	Yearly.	Daily.	Yearly.		
	Standard rate.	Rate from July 1st, 1924.	Rate from July 1st, 1924.	Rate from July 1st, 1924.		Married.		Single.			Married.	Single.	Married.	Single.					Married.	Single.
						£ s. d.	£ s. d.	£ s. d.	£ s. d.											
Flying Officer	£ s. d. 1 4 0	£ s. d. 1 2 8	£ s. d. 413 13 4	£ s. d. 447 2 6	3 6	1 7	0 9	1 8	2 0	8 9	7 11	159 13 9	144 9 7	£ s. d. 1 11 5	£ s. d. 1 10 7	£ s. d. 573 7 1	£ s. d. 558 2 11			
Flight Lieutenant	1 6 0	1 4 6	447 2 6		4 6	3 3	0 9	1 8	2 0	11 5	8 11	208 7 1	162 14 7	1 15 11	1 13 5	655 9 7	609 17 1			
" " after 2 years' service in the substantive rank	1 8 0	1 6 6	483 12 6		4 6	3 3	0 9	1 8	2 0	11 5	8 11	208 7 1	162 14 7	1 17 11	1 15 5	691 19 7	646 7 1			
" " " 4 " "	1 10 0	1 8 4	517 1 8		4 6	3 3	0 9	1 8	2 0	11 5	8 11	208 7 1	162 14 7	1 19 9	1 17 3	725 8 9	679 16 3			
Squadron Leader.. .. .	1 14 0	1 12 2	587 0 10		4 6	3 3	1 5	1 8	2 0	11 5	9 7	208 7 1	174 17 11	2 3 7	2 1 9	795 7 11	761 18 9			
" " after 2 years' service in the substantive rank	1 16 0	1 14 0	620 10 0		4 6	3 3	1 5	1 8	2 0	11 5	9 7	208 7 1	174 17 11	2 5 5	2 3 7	828 17 1	795 7 11			
" " " 4 " "	1 18 0	1 15 10	653 19 2		4 6	3 3	1 5	1 8	2 0	11 5	9 7	208 7 1	174 17 11	2 7 3	2 5 5	862 6 3	828 17 1			
" " " 6 " "	2 2 0	1 19 8	723 18 4		4 6	3 3	1 5	1 8	2 0	11 5	9 7	208 7 1	174 17 11	2 11 1	2 9 3	932 5 5	898 16 3			
Wing Commander	2 6 0	2 3 6	793 17 6		4 6	3 3	2 1	1 8	2 0	11 5	10 3	208 7 1	187 1 3	2 14 11	2 13 9	1,002 4 7	980 18 9			
" " after 2 years' service in the substantive rank	2 10 0	2 7 4	863 16 8		4 6	3 3	2 1	1 8	2 0	11 5	10 3	208 7 1	187 1 3	2 18 9	2 17 7	1,072 3 9	1,050 17 11			
" " " 4 " "	2 12 0	2 9 2	897 5 10		4 6	3 3	2 1	1 8	2 0	11 5	10 3	208 7 1	187 1 3	3 0 7	2 19 5	1,105 12 11	1,084 7 1			
" " " 6 " "	2 14 0	2 11 0	930 15 0		4 6	3 3	2 1	1 8	2 0	11 5	10 3	208 7 1	187 1 3	3 2 5	3 1 3	1,139 2 1	1,117 16 3			
Group Captain	3 0 0	2 16 8	1034 3 4		5 6	4 6	3 0	1 8	4 0	15 8	14 2	285 18 4	258 10 10	3 12 4	3 10 10	1,320 1 8	1,292 14 2			
" " after 2 years' service in the substantive rank	3 4 0	3 0 6	1104 2 6		5 6	4 6	3 0	1 8	4 0	15 8	14 2	285 18 4	258 10 10	3 16 2	3 14 8	1,390 0 10	1,362 13 4			
" " " 4 " "	3 8 0	3 4 4	1174 1 8		5 6	4 6	3 0	1 8	4 0	15 8	14 2	285 18 4	258 10 10	4 0 0	3 18 6	1,460 0 0	1,432 12 6			

2. The above rates of pay are liable to revision. The standard rates were drawn up in 1919 in the light of the then high cost of living, and 20 per cent. of each of the standard rates is regarded as detachable and subject to alteration, either upwards or downwards as the cost of living rises or falls. The first revision took effect from July 1st, 1924, when a reduction of approximately 5½ per cent. was made in the standard rates. Subsequent revisions will be made at intervals of three years.

3. It must, however, be clearly understood that while every consideration will be given to the reasonable and legitimate interests of individuals, it will be competent for the Air Council at any time to modify the regulations under which the emoluments of the R.A.F. are drawn, and no Officer will be entitled to claim any pay, gratuity, or other advantage conferred by a provision being at any time added to, varied, or cancelled.

4. For the purpose of the issue of allowances a "married officer" is one who is married and has attained the age of 30 or the substantive rank of Squadron Leader or who, irrespective of age and rank, was married on or before Sept. 15th, 1919, and was serving in the Royal Air Force on June 8th, 1922.

5. As allowances are given for specific purposes, the cost of which may vary at comparatively short intervals, the rates of allowances are liable to be reviewed as circumstances may require.

6. A colonial allowance is granted in certain commands abroad in aid of the expenses of living in the countries where the cost is higher than in the United Kingdom.

7. For periods of service given under Indian administration and payment, officers will come under the rates and conditions authorised from time to time by the Indian Government in so far as these rates and conditions may differ from those in this scheme. The Indian rates are at present under review.

There will be a minimum qualifying period for retired pay of 20 years.

The rates of retired pay given above (including the maximum rates) are standard rates which will be subject to revision as stated in paragraph 2 under Table I. The revision will apply to all retired pay which is being drawn at the date of revision as well as to subsequent awards.

Gratuities.

Short-service officers will be eligible for gratuities on passing to the Reserve on the scale of £100 for each of the first two complete years of service, and £150 for each of the third, fourth and fifth complete years. These gratuities will not be payable to officers granted permanent commissions, but the period of service under the short-service commission will count for retired pay.

Medical officers holding permanent commissions may, at the discretion of the Air Council, be allowed to retire voluntarily from the Service after ten years' commissioned service with a gratuity of £1250 or after 16 years with a gratuity of £2000 in lieu of retired pay.

COLONIAL MEDICAL SERVICE.

IN the self-governing dominions, Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland, and territories under their control, such as Papua and the Cook Islands, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; appointments in Egypt and the Soudan are regulated from the Foreign Office; in Southern Rhodesia the appointments are made by the local Government, but the British South Africa Company, London Wall Buildings, E.C., act as their agents in this country; in North Borneo application should be made to the British North Borneo Company, 37, Threadneedle-street, E.C., for appointments; and those in Sarawak are in the hands of H.H. the Rajah. Much valuable information will be found in the "Professional Handbook," Part II., issued by the Oversea Settlement Office, 3 and 4, Clement's Inn, Strand, London, W.C. 2, price 9d.

As a general rule, each Colony or Protectorate has its own public service distinct from that of every other; and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another. There are three exceptions to this rule: (a) The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, is one service. (b) The East African Medical Service, which serves Kenya, Uganda, Zanzibar, Nyasaland, Somaliland, and the Tanganyika Territory is one service. (c) In practice the medical services of the Straits Settlements and the Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States or vice versa.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the Secretary of State for the Colonies are (a) the West African—viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia; (b) the East African—viz., the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, the Tanganyika Territory, and Northern Rhodesia; (c) the Eastern—viz., Ceylon, the Straits Settlements and Malay States, Hong Kong, Mauritius, and Seychelles; (d) the West Indian—viz., British Guiana, Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, British Honduras, and the Bahamas; (e) Fiji and the Western Pacific, Cyprus, Gibraltar, St. Helena, Bermuda, and the Falkland Islands; and (f) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified

native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. Appointments in Malta are all filled locally. Vacancies occur most regularly and frequently in the West African Medical Staff, the East African Medical Service, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift of the Secretary of State for the Colonies should be between the ages of 23 and 35,¹ and must be doubly qualified; preference will be given to those who have held hospital appointments as house physicians and house surgeons; testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Sir William Prout, C.M.G., O.B.E., and Dr. A. E. Horn, C.M.G., 79, Harley-street, London, W. 1; Sir J. Hawtrey Benson, 57, Fitzwilliam-square, Dublin; Dr. Foster Coates, 9, Shaftesbury-square, Belfast; Lieut.-Colonel Glen Liston, C.I.E., I.M.S., 33, Comely Bank, Edinburgh; and Dr. R. H. Kennan, 2, St. James's-road, Liverpool. Applications for such appointments must be addressed to the Private Secretary (Appointments), Colonial Office, Downing-street, S.W. 1.

EAST AFRICAN MEDICAL SERVICE.

The Medical staffs of the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory form one service, the members of which are liable to be posted to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible.

Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Unless the Secretary of State directs to the contrary, they are required to attend a course of instruction at the London or Liverpool School of Tropical Medicine before taking up their appointments. If such a course is not taken before proceeding to East Africa, they are required to take it during their first leave of absence. Medical officers (but not sanitation officers) are permitted to take private practice at some stations, on the understanding that they give precedence to their official duties. It must be understood that additions to their income from this source are not likely to be substantial.

The currency in different Dependencies in East Africa varies. In Kenya, Uganda, and the Tanganyika Territory, an East African shilling (one-twentieth of a pound sterling) is the standard coin. Salaries and sterling allowances are issued locally in respect of resident service at a fixed rate of 20 shillings to the pound sterling. A special local allowance, averaging 15 per cent. of sterling salaries and allowances is at present issued in respect of resident service. The question of the continuance or otherwise of the allowance will be subject to review on Dec. 31st, 1925. In Zanzibar and Somaliland the Indian rupee is the standard coin, and for the present sterling salaries and allowances are issued at a fixed rate of 15 rupees to the pound. No local allowance is paid. In Nyasaland sterling currency is used, and no local allowance is paid.

Officers are provided with quarters free of rent (but not of rates or other similar outgoings), if quarters are available; if quarters are not available, the Government may provide temporary accommodation or alternatively, at the discretion of the Government, an allowance in lieu of quarters calculated at 15 per cent. of the initial salary of an officer's appointment may be paid. The salary of a medical or sanitation officer is £600 per annum, rising by annual

¹ In the case of East Africa, preference will be given to candidates who are over 25 years of age. In the case of Fiji and the Western Pacific, preference will be given to candidates who are under 30.

increments of £25 to £900 per annum, with efficiency bars at £700 and £800. Officers who possess the Diploma in Public Health on entering the service, or who acquire it while in the service, receive two special increments in the scale.

Officers of the East African Medical Service are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (a) After nine years' service, of which at least six must have been spent in East Africa, £1000; (b) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity, he thereby foregoes all claim to pension.

The grades and salaries (apart from ordinary medical and sanitation officers) in the medical departments are as follows:—

Kenya.—Director of Medical and Sanitary Services, £1200; Deputy Director of Medical Service, £1000; Deputy Director of Sanitary Service, £1000; Surgical Specialist, £900 by £50 to £1000; Director of Laboratory, £900 by £50 to £1000; Senior Medical Officers and Senior Sanitation Officers, £800 by £25 to £900.

Uganda.—As Kenya. (There are two Deputy Directors of Medical Service, one being for native services.)

Tanganyika Territory.—As Kenya, except that there is no surgical specialist.

Nyasaland.—Director of Medical and Sanitary Services, £1000; Senior Medical Officer and Senior Sanitation Officer, £800 by £25 to £900.

Zanzibar.—As Nyasaland. There is also a Surgical Specialist at £800 by £25 to £900.

Somaliland.—Principal Medical Officer, £800 by £25 to £900.

Sanitation officers are selected from the ranks of medical officers as occasion arises.

ASIA.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: \$440 per mensem, rising to \$480 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to \$500 per mensem, and thence by annual increments of \$25 per mensem to \$800 per mensem, with a strict efficiency bar at \$600 per mensem. This scale of salaries has been fixed on the supposition that medical officers join the service at about the age of 27. Above the concluding figure of \$800 per mensem there are certain higher appointments as follows: Principal Civil Medical Officer, Straits Settlements, and Principal Medical Officer, Federated Malay States, \$1200 per mensem. Class A: seven posts at \$1050 per mensem. Class B: nine posts at \$850, rising by \$30 to \$1000 per mensem.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed. They may, however, do, and receive fees for, consultative work, under conditions approved by the Government. Information about general conditions in Malaya is obtainable from the Malay States Information Agency, 88, Cannon-street, E.C. 4.

Seychelles.—The chief medical officer receives Rs.7000 and Rs.300 in fees. There are two assistant Government medical officers, one receiving Rs.6500, the other Rs.6000. One assistant medical officer is provided with free quarters in the New Hospital.

Hong-Kong.—The present establishment of the medical department is: principal civil medical officer, £1000-£50-£1200; eight medical officers, £600-£25-£1000; three port health officers, £600-£25-£1000; bacteriologist, £700-£25-£1000; two health officers, £600-£25-£1000, are also attached to the Sanitary Department. A temporary allowance on a scale varying with the sterling exchange value of the dollar is at present payable. Salaries are converted locally at the rate of 2s. = \$1. Free quarters are not provided, but in certain instances a rent allowance is paid by the Government.

AMERICA.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000-£1200 per annum, with consulting practice; one bacteriologist and pathologist, £450-£700 (increment £25), with £50 allowance in lieu of fees; 31 medical officers at £500-£25-£700. Some of the senior posts also carry duty allowances (varying from £50 to £300 per annum) and quarters. All the junior appointments in which private practice is not allowed carry duty allowances. Private practice is allowed in certain cases.

Trinidad and Tobago.—In Trinidad and Tobago there are over 40 appointments. On appointment Government medical officers, who are provided with free unfurnished quarters, receive salary at the rate of £400 per annum with annual increments of £25 accruing from the date of first appointment as supernumerary medical officers, until reaching the maximum of £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, the value of which is estimated at from £50 to £800 per annum. Officers employed in institution work receive allowances in lieu of private practice varying from £50 (and furnished quarters) to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). There are over 25 appointments. The chief medical and health officer, Grenada, receives £600-£700. The chief medical officer, St. Lucia, receives £600-£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government vary from £400-£500, and with allowances in certain cases. The Governor has the power to transfer a medical officer from one island to another at his discretion. The appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are of the same nature as in the Windward Islands and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary varying from £312 to £400, according to station, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands, and in certain districts may be required to perform magisterial duties. The medical officers receive fees for successful vaccinations, post-mortem examinations, attendance and giving evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also as a rule, allowed private practice. The chief medical officer, St. Kitts, receives £700-£25-£750 without private practice.

British Honduras.—There are seven medical appointments (besides the principal post of colonial surgeon) of which six are at a salary of \$2430 per annum and one at \$3159. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is approximately the same as that of the United States dollar.

OTHER OVERSEAS APPOINTMENTS.

Fiji and the Western Pacific.—In Fiji the Government medical officers receive a salary of £400, rising by annual increments of £25 to £600, with partly furnished quarters, or a house allowance of £50. In some districts a medical officer is also a district commissioner, with an additional allowance of £150.

They are allowed private practice, on the understanding that their official duties are not neglected. Private practice, however, cannot be guaranteed, and in most districts it is very small in amount. Where no private practice exists, a duty allowance of £50 is granted. They are required either to take charge of hospitals or of districts, at the discretion of the authorities. The posts are pensionable.

In addition to a chief medical officer (£800 a year, rising to £1000), a medical officer of health, Suva (£750-£900, not subject to bonus addition), a medical superintendent, Colonial Hospital (£500-£750, inclusive of allowance as officer in charge of the Medical School), and a medical superintendent, Makogai Leper Asylum (£600 rising to £800), there are in Fiji 11 medical officers, five of whom are also district commissioners. The salaries in Fiji are subject to temporary increases, the rate of bonus at the present time being 15 per cent. of the salary with the addition of £22 10s.

The staff in the British Solomon Islands Protectorate consists of one senior medical officer (£650 rising to £750) and two medical officers (£550 rising to £650). A local allowance at the rate of £50 per annum is also paid in respect of actual resident service in the Protectorate. In the Gilbert and Ellice Islands Colony there is one medical officer in charge (£650 rising to £750). Officers may be transferred from Fiji to the Western Pacific and vice versa at the discretion of the Secretary of State.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £900, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer, who is allowed consulting practice only) and receiving 2s. per diem forage allowance. There is also a medical officer of health on £600, rising by £20 increments to £720 without private practice; these are the only medical appointments in the island which are open to English candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £750, and private practice. There are also two assistant surgeons with a salary of £720 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £550 per annum, £20 fees as health officer, and £30 horse allowance. Private practice is allowed. The assistant colonial surgeon at present receives £500 a year and a horse allowance, and is allowed a share of the private practice. For contracts and appointments the colonial surgeon also receives about £250 a year and the assistant colonial surgeon about £150.

Falkland Islands.—There are two appointments. The colonial surgeon is paid at the rate of £600 per annum, with free furnished quarters. The assistant colonial surgeon is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters. Private practice is shared between the colonial surgeon and the assistant colonial surgeon. The office of colonial surgeon is pensionable.

*Palestine.*²—The grades and salaries of superior appointments in the Department of Health are: Director, £E1100-50-1400, plus £E100 expatriation allowance. Deputy director, senior medical officer (laboratory section), and senior medical officer (Jerusalem-Jaffa district) £E800-50-1100 plus £E100 expatriation allowance. Chemical analyst, three senior medical officers, and medical officer (Jerusalem-Jaffa district) £E550-25-750 plus £E50 expatriation allowance. The remainder of the staff is recruited locally. The salaries of the two highest grades will be reduced as vacancies occur.

² £1 Egyptian (of 100 piastres) is equivalent to £1 0s. 6d. sterling.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa on full salary is granted in the normal case after a tour of residential service (of not less than 20 and not usually more than 30 months) to an amount of six days for each completed month of residence (or three days when for any reason the officer is not returning to East Africa) exclusive of the periods of the voyages to and fro, for which full pay is also given. Officers serving in certain stations in Kenya and Nyasaland, are allowed five (or two and a half) days' leave in respect of each month of service instead of six (or three) days' leave respectively. In Somaliland special leave regulations exist which provide for an officer taking leave after a shorter tour of service than in other parts of East Africa. Free first-class passages are provided for the officer on first appointment and on leave, and in certain cases assistance towards family passages is given.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Up to the end of 1928 free passages are granted on first appointment and on leave, but the continuance of this privilege beyond that date is uncertain; but free passages on first appointment or transfer are granted permanently for officers with salary under £800 per annum.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of three years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months³ in any two years. In British Guiana officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay leave may be taken in addition to six months' full-pay leave.

On first appointment an officer whose salary and fees together do not exceed £800 a year will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—*East Africa.*—Officers on the pensionable establishment retire on attaining the age of 50 years or after 20 years' East African service, whichever is earlier; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-sixtieth of pensionable emoluments—i.e., salary and value of free quarters⁴—at the time of retirement, two years' service being reckoned as three years for this purpose, subject to an average of emoluments for the last two years before retirement instead of the actual emolu-

³ Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

⁴ The value of free quarters for pension purposes is taken as 15 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement.

ments at the time of retirement being taken as the basis for calculation in certain circumstances.

Other Colonies.—In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

WEST AFRICAN MEDICAL STAFF.

Applicants for appointment as medical officers in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government, and houses for the wives of junior medical officers are rarely available. Officers are not allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor; and permission to bring out young children will only be given in the most exceptional circumstances.

Candidates whom it is proposed to select for appointment will have to be medically examined by one of the medical advisers of the Colonial Office (or, in the case of those residing in a Colony, by a medical officer appointed by the Colonial Government), and no appointment will be made unless the candidate is declared to be physically fit for service in West Africa. Candidates are allowed to express a preference for any particular Colony or Protectorate, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony or Protectorate at the discretion of the Secretary of State. Candidates who wish to be posted to the Northern Provinces of Nigeria should be able to ride. Transfers from one Colony or Protectorate to another will be made as seldom as possible. Candidates should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred elsewhere, as the number of such transfers is exceedingly small.

Officers of the West African Medical Staff who may be transferred to pensionable appointments under the Crown elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies in any particular case that this is unnecessary.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction for three to five months, either at the London School of Tropical Medicine, Endsleigh-gardens, Euston-square, N.W. 1, or at the Liverpool School of Tropical Medicine, University, Liverpool. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for

board and lodging; an allowance of £3 a week will be paid to them monthly in arrear for this purpose. A daily allowance of 5s. (but no salary) will be paid to each candidate monthly in arrear during the course, and may be continued subsequently up to the date of embarkation. He will be bound to refund them (1) if he declines to accept an appointment in any of the Colonies or Protectorates for which he may be selected by the Secretary of State; (2) if he fails to obtain a certificate in regard to progress and efficiency, or (3) if he relinquishes the West African Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of the date of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—The Medical Services of the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—form one service under the name of the West African Medical Staff. All the medical officers for the service are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £360 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Sanitary Service, Nigeria, and the Deputy Director of Sanitary Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Sanitary Service, Gold Coast, receives a salary of £1400 a year, with duty allowance at the rate of £280 a year. Assistant Directors Medical Service: There are nine appointments on this grade, six in Nigeria, two in the Gold Coast, and one in Sierra Leone. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Sanitary Service, Nigeria, the Deputy Director of Sanitary Service in the Gold Coast and the Deputy Director of Sanitary Service in Sierra Leone receive salary at the rate of £1300 a year, with duty allowance at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being eligible for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present five officers appointed specialists in Nigeria and three in the Gold Coast. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority

allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Sanitary Officer: There are six appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year. Medical Officer: The salary attached to this grade is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year.

A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000-£50-£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The Director of the Medical Research Institute, Lagos, and the Director of Research, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. Salary at the rate of £800 a year, rising by annual increments of £40 to £960 a year is attached to about 14 posts (those of assistant at the Medical Research Institute, Lagos, and medical officers of health at various places), irrespective of the seniority of the officer holding the appointment. In addition to the seniority allowance (£72 a year), staff pay at the rate of £150 a year is also attached to these posts; and the holder of the appointment draws half of the staff pay during leave of absence, the remainder being drawn by his locum tenens. The holders of these appointments are not allowed private practice.

Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of an officer during the period of employment qualifying for increment is approved.

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at the majority of stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement from the service are granted in accordance with the law and regulations of each individual Colony.

Fuller information can be obtained from the Private Secretary, Colonial Office, Whitehall, London, S.W. 1.

SUDAN MEDICAL SERVICE.

This service is responsible for carrying out civil medical work and public health duties in the Sudan. The staff consists of: (a) Director, Sudan Medical Service—pay £1500-£1800; (b) senior physician—pay £1200-£1750—and (c) senior surgeon—pay £1200-£1750—Khartoum and Omdurman Civil Hospitals; (d) medical officer of health, Khartoum Province and assistant director—pay £1200 (this post is of a temporary nature and the terms and nature of the duties are subject to alteration); (e) a number of (at present 16) senior medical inspectors and medical

inspectors who are all British. Their pay commences at £720 and rises, subject to the recommendation of the director, by five biennial increases to £1080 and thence, after three years at £1080, to £1200. Senior medical inspectors are eligible for promotion by selection to the four senior posts. Every medical inspector is appointed on probation for two years. If at the expiration of this time he is taken on the permanent service of the Government, his increase of pay is subject to passing such examination in Arabic as may be required by the regulations. (f) A number of medical officers trained at one of the Syrian medical schools. (g) A number of assistant medical officers, natives of the Sudan, who have been given a purely clinical training in one of the larger Sudan hospitals.

Among the attractions of the service is the annual leave of 90 days for every year's service which under ordinary circumstances may be granted every year, study-leave for some definite purpose, and two years granted towards pension to men with higher qualifications and experience. The ordinary pension for a medical inspector retiring after 20 years' service is approximately £500 a year. Private practice is limited to a few of the larger towns, but may be carried on so long as it does not in any way interfere with official duties. These duties include the charge of the medical and sanitary work of a province; acting as a consultant to the hospitals of the province or supervising smaller hospitals or dispensaries; initiating and supervising the medical and sanitary work of a province; the medical supervision of schools; the examination of candidates for Government service and pension; and the training of assistant medical officers and native sanitary overseers.

Vacant Appointments.—At the present moment there are vacancies for medical inspectors, who must be single, under 30 years of age, and who must have held a resident appointment (preferably house surgeon) to a large general hospital. Applications in writing only, with copies of recent testimonials, should be made to Dr. T. D. Acland, 19, Bryanston-square, W. 1, from whom and from the Secretaries or Deans of the principal medical schools, further particulars can be obtained.

SPECIAL DIPLOMAS.

DIPLOMA IN TROPICAL MEDICINE.

ALTHOUGH a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Tropical Medicine, 5, Endsleigh-gardens, London, N.W. 1 (founded in 1899), which is a school of the University of London in the Faculty of Medicine.

University of Cambridge.—The examination for the Diploma in Tropical Medicine and Hygiene is divided into two parts. Part I. is held in Cambridge in April and Part II. in July in London. Candidates for Part I. are examined under the same regulations and in the same subjects as candidates for the Diploma in Public Health, but any qualification in medicine or surgery recognised by the proper authority of any country outside the British Dominions may be recognised. The subjects for Part II. are Medicine, Surgery, and Hygiene in their relation to Tropical Disease.

The examination will be partly in writing, partly oral, and partly practical or clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment). Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma (D.T.M. & H.) testifying to his knowledge and skill in tropical medicine and hygiene.

The fee for each part of the examination is £10 10s., and applications should be addressed to Mr. J. E. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—The M.D. degree may be taken in tropical medicine at an examination held twice annually, for which a thesis may be submitted.

University of Liverpool.—The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (a) Tropical Pathology, Parasitology and Entomology; (b) Tropical and Applied Bacteriology; (c) Tropical Hygiene and Sanitation; (d) Tropical Medicine, including Ætiology, Symptoms, Diagnosis, and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. The fee for the full course of instruction is £21, with an extra charge of 10s. 6d. for the use of a microscope if required. Applications should be made to the Dean of the Medical Faculty, University of Liverpool. A diploma in Tropical Hygiene (D.T.H.) has recently been established. The subjects of examination are bacteriology, chemistry (including meteorology and climatology), entomology, protozoology, and helminthology; tropical sanitation (including sanitary engineering); practical sanitation. Fee for the course, £15. Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The diploma of D.T.M. & H. Eng. is awarded on the results of an examination held twice yearly, in February and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than five months, (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Fee for admission to the examination, £9 9s., 14 days' notice of entry to the Secretary, Examination Hall, Queen-square, London, W.C. 1.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

The Universities of Cambridge, London, Durham, Leeds, Manchester, and Edinburgh, and the Conjoint Board of the R.C.P. Lond. and R.C.S. Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge. The fee for the whole course (Parts I. and II.) is 15 guineas, or for either part separately 10 guineas.

Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to

qualified medical practitioners apart from the courses of instruction. Inquiries as to lectures should be addressed to the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E. 5; and as to clinical facilities, to the Medical Superintendent at the same address.

A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various Universities, is held at Bethlem Royal Hospital twice annually, during the spring and autumn. The fee for the full course is 15 guineas; for Part A separately 10 guineas, and for Part B separately 10 guineas. Communications should be addressed to the Physician-Superintendent, Bethlem Royal Hospital, London, S.E. 1. In addition clinical instruction in psychological medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 o'clock. The fee for post-graduates is 5 guineas for three months' attendance, but a reduction is made to those who attend the diploma course.

DIPLOMA IN OPHTHALMIC MEDICINE.

SPECIAL diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.—The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in July, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in January and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable qualification. Fee for admission to each part, £6 6s.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

THIS Diploma is granted by the University of Cambridge. It is only open to those who hold a medical qualification, and includes a course of lectures and practical work in Physics (Part I.), and in Radiology and Electrology (Part II.). Attendances at the necessary course of lectures in both subjects and, in addition, six months' clinical experience in an adequately equipped hospital recognised by the Committee are essential. The whole course of study takes six months, the lectures, practical work, and hospital attendance running concurrently. The Courses carried out by the University of Cambridge are at present arranged to begin early in January. Three months are spent in Cambridge doing the lectures and practical work in Part I., attending the systematic lectures in Part II., and the practice of Addenbrooke's Hospital, where there is a fully equipped and up-to-date X ray and Electrolological Department. The remaining three months can be completed at any recognised hospital, but special arrangements are made for students to continue their studies in London, where demonstrations at various hospitals are arranged in order to give a wide experience. In addition, an independent course is arranged by the British Association of Radiology and Physio-Therapy. This Course is held entirely in London, but is recognised by the University as qualifying for the examination, and begins early in October. Further particulars as to the Cambridge

Course can be obtained from Dr. F. Shillington Scales, Medical Schools, Cambridge, and of the London Courses from Dr. Stanley Melville, at the Offices of the B.A.R.P., 12, Stratford Place, London, W. 1.

DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.

THE Conjoint Board R.C.P. Lond., R.C.S. Eng., grants the D.L.O. after an examination held in two parts, twice yearly, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and oesophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and oesophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification. The fee for admission to each part is 6 guineas.

DIPLOMA IN TUBERCULOUS DISEASES.

A DIPLOMA in Tuberculous Diseases is given by the University of Wales. Candidates must possess a medical qualification registrable for practice in Great Britain and Ireland, and be not less than 25 years of age, and either (Category A) have held, for a period of not less than five years, whole-time appointments for work in tuberculosis; or (Category B) have held a registrable qualification to practise for at least one year, and presented (a) a certificate of satisfactory pursuance of a course of consecutive post-graduate study of the clinical and epidemiological aspects of tuberculosis of six months' duration at a recognised university, medical school, or hospital where such a course is given; or, alternatively, a certificate of one year's post-graduate work as a whole-time member of the staff of a tuberculosis hospital, sanatorium, or dispensary approved by the Ministry of Health, signed by the representative of the authorities for whom the work was performed or by the administrative medical officer concerned; (b) a certificate of satisfactory pursuance of a course of consecutive post-graduate practical study of the Pathology and Bacteriology of Tuberculosis of three months' duration at a tuberculosis laboratory or a recognised general laboratory where such a course is given; (c) a certificate of three months' satisfactory attendance at a tuberculosis institute or dispensary. The courses may be taken concurrently.

The examination is divided into two parts. The fee for examination is £10 10s. Applications should be made to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th.

THE DEGREE OF M.D. BRUSSELS.

To obtain the degree of M.D. Brussels all foreign graduates must submit their degrees or diplomas for consideration to the Secretary of the University of Brussels. According to the standard of the qualification, a period of one, two, or three years must be spent by the candidate in attending lectures, clinics, and practical work at Brussels, in the University, before permission is given to enter for examinations. The standard of this degree, known as the "Scientific" M.D., is equivalent to that of the "legal" M.D. obtainable from the University only after seven years' residence, but it does not carry with it the right to practise in Belgium. The examinations are conducted orally in French. Further information may be obtained from the Hon. Secretary of the Brussels Medical Graduates' Association, Dr. Arthur Haydon, 10, Sussex-gardens, Talbot-square, Hyde Park, London, W. 2.

DIPLOMA IN PUBLIC HEALTH.

As usual we include in the Students' Number of THE LANCET an epitome of the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council from 1902 to 1922. The new regulations, which came into force in 1923, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

Conjoint Board of the R.C.P. Lond. and R.C.S. Eng.

—New regulations came into force on Jan. 1st, 1924, which apply to all candidates who have not commenced bonâ-fide study of Public Health in accordance with the above regulations before that date. They are as follows: The Examination consists of two Parts. Part I. will be held in the months of January and June, and Part II. in the months of January and July in each year. Candidates may enter for Parts I. and II. separately or at the same time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious Diseases, Food Inspection, and Inspection of selected Premises. The Fee for admission to each Part of the Examination, which must be paid three days before that part commences, is £10 10s., except in the case of Candidates who possess the Licence, Membership, or Fellowship of the Royal College of Physicians of London, or the Membership or Fellowship of the Royal College of Surgeons of England, who will be required to pay £6 6s. only for each part. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next Examination on payment of the same Fees. Candidates intending to present themselves for either part of the Examination must give 14 days' notice in writing to the Secretary, at the Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

Candidates will be admissible to Examination in Part I. on producing evidence:—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.
2. Of having attended during a period of not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (a) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (b) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical laboratory work. (c) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence:—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.
2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects:—(a) The Principles of Public Health and Sanitation for not less than 30 hours; (b) Epidemiology and Vital Statistics for not less than 20 hours; (c) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (d) Sanitary Construction and Planning during not less than 10 hours.
3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. The Certificate

must state that the candidate has attended on one or more days in each week of the three months, that each attendance was of two hours' duration, with a total attendance of 60 hours.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to: (a) Maternity and Child Welfare Service; (b) Health Service for children of school age; (c) Venereal Diseases Service; (d) Tuberculosis Service; (e) Industrial Hygiene; (f) Inspection and Control of Food, including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—An examination, conducted partly in writing, partly *vivâ voce*, and in each subject partly practical, is held in Michaelmas and in Trinity Term in the following subjects:—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately; but Part I. must be passed either before or at the same examination as Part II. The fee for admission to the examination is £10 for each part. Successful candidates are entitled to receive the Diploma in Public Health.

The First Part of the examination will comprise (a) written papers of three hours each in (i.) Chemistry and Physics, and (ii.) Pathology and Bacteriology; (b) a three hours' practical and *vivâ voce* examination in Chemistry and Physics; (c) a three hours' practical and *vivâ voce* examination in Pathology and Bacteriology.

The Second Part of the Examination will consist of the following parts:—(a) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health); (b) a practical and *vivâ voce* examination in General Hygiene; and (c) a three hours' practical and *vivâ voce* examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce certificates (1) of Laboratory Work in Chemistry, Physics, Meteorology, and Climatology as applied to Hygiene, and (2) of having had Practical Instruction in Bacteriology and Parasitology and the Pathology of the Diseases of Animals transmissible to Man.

Candidates in Part II. will produce the following further certificates: (3) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration.

All the above degrees are now open to Women Students, and particulars of Scholarships, &c., may be obtained from the Principals of the various Ladies' Colleges. The names of candidates for the Diploma in Public Health must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford. Applications for any further information should be addressed to the Dean, Department of Medicine, Museum, Oxford.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately or for

both together at their option; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) Part I. of the examination; or (2) Part II. of the examination. Every candidate will be required to pay a fee of £10 10s. before admission or readmission to *either part* of the examination. Candidates must before admission to either part of the examination produce evidence of having satisfied the regulations applicable to Part I. and Part II.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene, Chemistry, &c., and on Bacteriology and Parasitology. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital, and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also special courses in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England.

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations have been revised and may be obtained on application to the Principal Officer, University of London, South Kensington.

University of Durham.—The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University, and no candidate is admitted to the final examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a registrable qualification. Candidates for the B.Hy. must attend this course at the University of Durham; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or institution which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate must pass in all the subjects of Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects: Bacteriology and Parasitology (including medical entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (including sanitary construction), Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof. The fee for the examination for the degree of B.Hy. is £10 10s. and for the degree £6 6s. The fee for the examination for the Diploma in Public Health is £10 10s. and for the diploma £3. Doctor of Hygiene

(D.Hy.): Candidates must be Bachelors of Hygiene of two years' standing, and are required to satisfy the examiners that they have conducted original research in the subject of Public Health. The fee for the examination is £20 and for the degree £10.

Victoria University of Manchester.—An examination in Public Health is held twice yearly. The examination is in two parts and is written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination. The fee for each part of the examination is £8 8s., and must be paid on or before July 1st in each year. For any subsequent examination in the same part the fee will be £4 4s. Every candidate who has passed both parts of the examination to the satisfaction of the examiners, and who is legally registered, will receive a Diploma in Public Health. The examination will begin about the middle of July and the middle of October in each year. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice. An examination for a Diploma in Bacteriology is held for graduates in science or medicine who have attended prescribed courses for at least one academic year; candidates must present a satisfactory thesis on an approved subject.

University of Birmingham.—Under the revised rules and regulations of the General Medical Council the University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. The examinations will be held in the months of March and June and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5s. Medical Officers of the Royal Navy who have attended courses in Hygienic Chemistry, Bacteriology, and Public Health at the Naval Medical School, Greenwich, will be admitted to Part I. examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied Chemistry and Bacteriology at the Staff College and pursued the further course of study approved by the General Medical Council.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years; the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken out at any time, and students are allowed to work daily in the laboratories. Composition fee for M.H. £40 a session, and D.P.H. £45 a course.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Fees.—The fee for each part is £6 6s., and

for any subsequent examination in the same part £4 4s. Instruction in Entomology and Meteorology is given in the first term, and in Sanitary Chemistry and Bacteriology in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Academic Sub-Dean of the Medical School.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulation. The examination is divided into two parts.

University of Wales.—Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months subsequent to the attainment of a registrable qualification, must produce evidence of having attended for not less than five months at the Welsh National School of Medicine or at an institution approved by the Court, practical instruction in Bacteriology and Parasitology, Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must also produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of Part I. before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written and oral, and includes Bacteriology and Parasitology (including Medical Entomology); Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, includes: Hygiene and Sanitation (including Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered before admission to Part II. of the examination. An examination in each part will be held annually, in June. Notice of candidature, together with the fee of six guineas for either part of the examination, must be sent to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th.

University of Edinburgh.—Two degrees in Science in the Department of Public Health are conferred by the University of Edinburgh—viz., Bachelor of Science in Public Health and Doctor of Science in Public Health. A Diploma in Tropical Medicine and Hygiene is also granted. Candidates for the degree of B.Sc. in Public Health must be graduates in Medicine of a recognised University, and must pass two examinations, for the first of which they must, after graduation in Medicine, have worked for at least 20 hours per week during a period of not less than eight months, of which at least five consecutive months must be in the Public Health Laboratory of the University of Edinburgh and the remainder either there or in a laboratory recognised by that University;

they must also have attended courses of instruction in Physics and Geology in some Scottish University. Candidates are not admitted to the Second Examination sooner than six months after having passed the First Examination, nor sooner than 18 months after having taken their degree in Medicine, and they must have attended two separate courses in Public Health in some University of the United Kingdom or in such medical school or Indian, Colonial, or Foreign University as may be approved for the purpose by Edinburgh University, each course consisting of 40 lectures at least; one of which courses shall deal with medicine and the other with engineering, each in its relation to public health. The subjects of examination include Laboratory work, Physics, Geology, Medicine in its application to Public Health, Sanitation, Sanitary Law, and Vital Statistics. Graduates who have held the degree of B.Sc. in Public Health from the University of Edinburgh for a term of five years may offer themselves for the degree of D.Sc. in Public Health in that University. They must then present a Thesis and pass an examination in Public Health. The fees are £4 4s. for the First and £5 5s. for the Second B.Sc. Examinations, and £15 15s. for the degree of D.Sc.

University of Aberdeen.—Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months. At least one academic term must be spent at the University of Aberdeen. Every candidate shall produce evidence of having complied with the following requirements in respect of study and training:—1. Practical instruction in the following subjects within a laboratory or laboratories approved by the University: (a) Bacteriology and Parasitology (including Medical Entomology), in relation to diseases of man and diseases of lower animals transmissible to man—at least 180 hours, of which not less than 150 shall be occupied in practical laboratory work; (b) Chemistry and Physics, in relation to Public Health—at least 90 hours, of which not less than 70 shall be occupied in practical laboratory work; (c) Meteorology and Climatology, in relation to Public Health—at least 10 hours; such instruction to extend over not less than five months or two academic terms. 2. A course or courses of instruction extending over not less than 80 hours dealing with: (a) The Principles of Public Health and Sanitation—30 hours; (b) Epidemiology and Vital Statistics—20 hours; (c) Sanitary Law and Administration (including Public Medical Services)—20 hours; (d) Sanitary Construction and Planning—10 hours; such course or courses to be given at an institution or by a teacher or teachers approved by the University. 3. Practical instruction, clinical and administrative, within a recognised hospital for general infectious diseases; such instruction to extend over three months, and to include 30 daily attendances of not less than two hours in each week. 4. Practical instruction and experience, during not less than six months (including attendance of at least three hours on each of sixty working days) in the duties, routine and special, of public health administration, under the supervision of a medical officer of health, who shall certify that the candidate has received from this officer or other competent medical officer, practical instruction in these duties, and also in those relating to: (a) Maternity and Child Welfare Service; (b) Health Service for Children of School Age; (c) Venereal Diseases

Service; (d) Tuberculosis Service; (e) Industrial Hygiene; (f) Inspection and Control of Food, including meat and milk. The medical officers of health recognised for this purpose by the General Medical Council are: (a) a medical officer of health who devotes his whole time to public health work; or (b) the medical officer of health of a sanitary area having a population of not less than 50,000; or (c) in Ireland, the medical superintendent officer of health of a county or county borough having a population of not less than 50,000. The examination for the diploma is divided into two parts, each of which extends over not less than three days. The following are the fees payable for the courses of instruction given within the University: Lecture Course or Courses, £4 4s.; Laboratory Instruction, £14. The examination fee is £8 8s., which is payable as follows:—£4 4s. for Part I., and £4 4s. for Part II. The fees for external instruction amount approximately to £11 11s.

University of Glasgow.—*Degree of B.Sc. in Public Health.*—Candidates must be graduates in Medicine of a University of the United Kingdom, or of some other University recognised for the purpose by the University Court. Candidates must produce evidence (1) that, after they have obtained a registrable Degree in Medicine, a period of not less than two years has elapsed; (2) that, after they have obtained a registrable degree in Medicine, they have, during a period of not less than 21 calendar months, pursued the course of work and instruction prescribed, and have satisfied the examiners in the prescribed examinations. There are two examinations. Part I. includes the following subjects: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health; (iv) Higher Chemistry in relation to Public Health; (v) Physics and Geology. A candidate must pass in the subjects marked (i), (ii), and (iii) of Part I. at one examination. Part II. includes the following subjects: (vi) Hygiene and Sanitation (including Sanitary construction); (vii) Epidemiology and Infectious Diseases; (viii) Sanitary Law and Vital Statistics; (ix) Public Health Administration; (x) Applied Hygiene. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene may be on a selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the

subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.—The Diploma in Public Health is open to medical graduates of a University of the United Kingdom. The examination is in two parts. (1) (a) Bacteriology and Parasitology; (b) Chemistry and Physics; (c) Meteorology and Climatology. (2) Hygiene and Sanitation, Epidemiology and Infectious Diseases, Sanitary Law and Vital Statistics, Public Health Administration. Before admission to the first examination the candidate must have held his medical degree for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part of all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but graduates of another University must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in United College, Dundee. The examination fee for each division is £5 5s.

University of Dublin (Trinity College).—The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, five months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: The principles of public health and sanitation; epidemiology and vital statistics; sanitary law and administration (including public medical services); sanitary construction and planning, must have studied, practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification and his admission to the Final Examination for the Diploma. The curriculum extends over a period of not less than 12 calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Physics, Meteorology and Climatology, and Bacteriology and Parasitology. Part II. comprises the following subjects: Hygiene and Sanitation, Sanitary Law, and Vital Statistics, Epidemiology and Infectious Diseases, Public Health Administration. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (a) shall have received the

degrees of M.B., B.Ch., and B.A.O. at least two years previously; (b) shall have pursued an approved course of study in the Faculty of Medicine; and (c) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The examination will be held in two parts, in March and in June. The first part of the examination will have reference to the general principles of sanitary science and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The fee for each part is 1 guinea.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. Candidates must have attended not less than four calendar months' practical instruction in Chemistry and Bacteriology in a recognised laboratory or laboratories, must have studied outdoor sanitary work for six months under a medical officer of health or other sanitary officer; and must give evidence of attendance for three months at the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration. The examination consists of two parts, and candidates may enter for both at one period or for either separately. The First Part includes (a) Laboratory Work (Chemistry and Bacteriology), (b) Physics and Meteorology; and the Second Examination embraces (a) Report on Premises visited, (b) Examination at Fever Hospital, (c) Examination at Public Abattoir, (d) Written and Oral Examinations on Epidemiology and Endemiology, (e) Vital Statistics and Sanitary Law, and (f) Practical Sanitation. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 3 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in May in Glasgow, and October in Edinburgh. The published regulations provide detailed synopses of the subjects of examination, and intimation is made that the curriculum and examination will be adjusted to meet the requirements of the regulations of the General Medical Council which came into force on Jan. 1st, 1924. Candidates applying for Regulations should state date of commencement of curriculum. The Registrar for Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and for Glasgow Mr. Walter Hurst, 242, St. Vincent-street.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must observe the following rules: 1. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery and his admission to the Final Examination for a Diploma in Public Health. 2. The curriculum for a Diploma in Public Health shall extend over a period of not less than 12 calendar months subsequent to

the attainment of a registrable qualification. 3. Every candidate shall produce evidence of having attended, during a period of not less than five months, at an institution approved by the Licensing Body granting the Diploma, practical instruction in—(a) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man, and to those diseases of the lower animals which are transmissible to man; (b) Chemistry and Physics in relation to Public Health; (c) Meteorology and Climatology in relation to Public Health. At least 180 hours must be devoted to Course (a), of which not less than 150 hours shall be occupied in practical Laboratory work. At least 90 hours must be devoted to Course (b), of which not less than 70 hours shall be occupied in practical Laboratory work. At least 10 hours must be devoted to Course (c). 4. Evidence of having received, during not less than 80 hours, at an institution or from teachers approved by the Licensing Body granting the Diploma, instruction in the following subjects: (a) The Principles of Public Health and Sanitation; (b) Epidemiology and Vital Statistics; (c) Sanitary Law and Administration (including Public Medical Services); (d) Sanitary Construction and Planning. 5. Evidence that he has attended for three months on the clinical practice of a recognised Hospital for Infectious Diseases. 6. Evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health. The examination for the Diploma is divided into two parts. The examination for Part I. includes Bacteriology and Parasitology (with Medical Entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. The examination for Part II. includes Hygiene and Sanitation (with Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination, which is written and oral, includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises—dwellings, factories, workshops, schools, &c.

DENTAL SURGERY.

ANYONE who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available.

THE DENTAL BOARD OF THE UNITED KINGDOM.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly-constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The following are the names and sources of appointment of the members: Chairman of the Board, Rt. Hon. F. Dyke Acland, appointed by the Privy Council. Members of the Board: Mr. L. G. Brock, C.B., appointed by the Minister of Health; Mr. A. Young, appointed by the Scottish Board of Health; Mr. J. H. Stirling, appointed by the Governor-General of Northern Ireland; Sir Holburt Waring, M.S., F.R.C.S.; Sir James Hodsdon, K.B.E., F.R.C.S. Edin.; Mr. T. Sinclair, C.B., F.R.C.S., M.P., appointed

by the General Medical Council; Mr. W. R. Ackland, M.D.S., M.R.C.S.; Mr. W. H. Dolamore, L.D.S., M.R.C.S., elected as Direct Representative by the qualified dentists practising in England and Wales; Mr. W. Guy, L.D.S., F.R.C.S., elected as a Direct Representative by the qualified dentists practising in Scotland; Mr. J. J. Andrew, L.D.S., elected as Direct Representative by the qualified dentists practising in Ireland; Mr. W. F. Bowen and Mr. F. Butterfield elected as Direct Representatives by registered dentists not being qualified dentists. Treasurers of the Board, Sir Holburt Waring and Mr. W. H. Dolamore. Registrar of the Board, Mr. N. C. King.

The offices of the Board are at 44, Hallam-street, London, W. 1, adjoining the offices of the General Medical Council.

REGISTRATION OF DENTAL STUDENTS.

The following are the General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923.

The Council recommends that, subject to such exceptions as the Council may from time to time allow, every dental student at the commencement of his studentship should be registered in the manner and under the conditions hereinafter set forth.

1. The registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and is subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence by pupilage with a registered dental practitioner.

2. Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in mechanical dentistry (see No. 3 below).

3. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school.

4. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study.

5. The necessary instruction in dental mechanics, or any part of it, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in dental mechanics to a registered practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations (see No. 3 above).

EXAMINING AND TEACHING BODIES IN DENTISTRY.

The list of the Examining Bodies in Dentistry which grant diplomas or degrees in this subject and the regulations for obtaining these qualifications will appear in a guide to teaching institutions in dentistry at a later date.

In addition to facilities provided by the various Universities, Colleges, and Faculties, a number of dental courses are available. In London at the Royal Dental Hospital (School of Dental Surgery), Leicester-square, at University College Hospital Dental School, and at the Dental Departments of Guy's Hospital and of the London Hospital. In the provinces at the Birmingham, Manchester, and Newcastle-on-Tyne dental hospitals. In Scotland at the Incorporated Edinburgh Dental Hospital, the Incorporated Glasgow Dental Hospital, and the Dental Department of Glasgow Royal Infirmary. In Ireland at the Incorporated Dental Hospital of Ireland, Dublin. Dental study may be commenced also at any of the following

schools: Birmingham Dental Hospital, Bristol Royal Infirmary and General Hospital, Dundee Dental Hospital, Leeds Dental Hospital, Liverpool Dental Hospital, and Sheffield Royal Hospital.

MINISTRY OF HEALTH APPOINTMENTS.

THE Minister of Health appoints medical officers of the Ministry in various parts of England and Wales in connexion with the National Health Insurance Medical Service. The duties of these officers include those of deputy to the Regional Medical Officer in the work carried out by the latter: (a) As Medical Referee in cases of insured persons referred for a second medical opinion on questions of incapacity for work, or of restoration of working capacity; (b) in assisting in the administration of the Insurance Medical Service.

Residence.—Medical Officers are required to reside in the area from time to time assigned to them.

Remuneration.—The rate of remuneration is £800 per annum, rising by annual increments of £30 to a maximum of £1100. No cost of living bonus is payable in addition thereto, but officers appointed to this scale will be established Civil Servants with the usual pension rights.

Successful candidates, who are considered to possess exceptional or special qualifications, may be allowed to enter the scale at a commencing salary of £850 per annum. Above the grade of Deputy Regional Medical Officer, there are at present 33 posts of Regional Medical Officers (30 in England and 3 in Wales) rising to a maximum of £1400 a year inclusive, and four posts of Divisional Medical Officers rising to a maximum of £1600 a year inclusive. The above numbers are, however, subject to revision from time to time as the exigencies of the Service may determine. When vacancies are to be filled among the Regional Medical Officers, preference will be given to those who have given satisfaction as Deputy Regional Medical Officers.

In England application should be made to the Secretary, Ministry of Health, Whitehall, London, S.W. 1, and in Wales to the Secretary, Welsh Board of Health, City Hall, Cardiff. Letters of application should be marked in bold letters, "Medical Officer."

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. 1. In the smaller prisons the medical officership is part-time, and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from the seniors of this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £600, making the pay at present with bonus £504 14s. to £801 11s.; Medical Officer, Class I., £650, rising by annual increments of £25 to £800, plus bonus, making the pay £864 to £1023 9s. Unfurnished quarters are provided or an allowance in lieu is made. There are 12 full-time medical officers of Class I. and 13 Class II., and 23 part-time medical officers. The number of vacancies is never large and promotion is slow. In the case of a part-time medical officer, the population of the prison is the basis of fixing the salary, unless there are some special features justifying special consideration.

Obituary.

PERCIVAL LANGDON-DOWN, M.A., M.B.,
B.Ch. Camb.,

JOINT SUPERINTENDENT, NORMANSFIELD, MIDDLESEX.

Dr. Percival Langdon-Down, of Teddington-on-Thames, who died on August 19th, received his medical education at the London Hospital, proceeding to the degree of M.B., B.Ch. Camb., and holding the post of house surgeon at his hospital. He was the son of Dr. H. Langdon-Down, the founder of Normansfield, the well-known private institution for mentally defective cases. Together with his brother Reginald, Dr. Percival Langdon-Down carried on this work and was an authority on mental disorders. In addition, he took an active interest in public affairs. He first became a member of the local district council in 1900 and continued to represent the South Ward until his death. He was for several years chairman of the council and was its senior member, only four of those who were on it in 1900 being still alive. His value was early recognised and within a year of his election he was made chairman of the by-laws committee, a thorny subject on which he became a recognised authority. For many years he sat as a representative of the riparian districts of Teddington, Hampton, Hampton Wick, and Surbiton on the Thames Conservancy, and at the quarterly meetings of the representatives of these districts he was in the habit of presenting reports which were of the greatest value. He was keenly interested in the river and was a leader in the steps that were taken some years ago to obtain photographic and other records of the riverside. There were few movements set on foot for the good of Teddington which did not find in him an ardent and generous supporter. He took a great interest in the Cottage Hospital, of which his late father had been one of the medical attendants, and for some years he presided at the annual hospital meeting held at the Wesleyan Church by the brotherhood. He was one of the earliest members of the Teddington and Hampton branch of the League of Nations Union, of which he was the president. He was a vice-president of the Thames Valley Association of Cornishmen and Devonians. In his death all local interests, as well as the medical profession, have sustained a severe loss.

THE LATE DR. J. F. GORDON DILL.

WE regret to learn the death of Dr. J. F. Gordon Dill, consulting physician to the Royal Sussex County Hospital, which occurred at Hove on August 22nd last. A fuller notice will be published in an early issue of THE LANCET. He had been anxiously ill for some months and had undergone a serious operation, so that the end may have been expected by many of his numerous personal friends.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Aug. 31st.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Dr. Trevor Davies: Diseases of Women.

TUESDAY, Sept. 1st.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Dr. Dowling: Skin Dept.

THURSDAY.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 12 noon, Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

THE
Physiological Basis
OF
ATHLETIC RECORDS.

*Being the Presidential Address to the Section of
Physiology of the British Association.*

BY PROF. A. V. HILL, O.B.E., Sc.D., F.R.S.

IN the study of the physiology of muscular exercise there is a vast store of accurate information, hitherto almost unexploited, in the records of athletic sports and racing. The greatest efforts and the most intense care have been expended in making what are really experiments upon these subjects, and the results obtained represent what may justly be described as a collection of natural constants of muscular effort in the human race. It is the purpose of this address to discuss certain aspects of the data available in connexion with various forms of racing, and to see how far physiological principles at present known underlie them.

SOURCES OF INFORMATION.

The most complete set of records available, for a great variety of sports, is to be found in "The World's Almanac and Book of Facts," published by the *New York World*. Much of the information here presented was obtained from the 1925 edition of that work; similar but less extensive data can be found in our own Whitaker's Almanack. In addition, various books on horse-racing, on swimming, and on rowing have been searched for suitable material. I will not deal further with the statistical analysis of the facts, beyond referring to an extremely interesting and suggestive collection of them given in a paper by A. E. Kennelly, entitled *An Approximate Law of Fatigue in the Speed of Racing Animals*, published in the *Proceedings of the American Academy of Arts and Sciences* (vol. xlii., p. 275, 1906).

FATIGUE AS THE DETERMINING FACTOR.

An important and interesting problem for any young athlete is presented by the question "how fast can I run some given distance?" The maximum speed at which a given distance can be covered is known to vary largely with the distance. What are the factors determining the variation of speed with distance? How far, knowing a man's best times at two distances, can one interpolate between them for an intermediate distance, or extrapolate for a distance greater or less? Obviously the answer to such questions depends upon the factor which in general terms we designate fatigue. Fatigue, however, is a very indefinite and inexact expression; it is necessary to define it quantitatively before we can employ it in a quantitative discussion such as this. There are many varieties of fatigue, but of these only a few concern us now. There is that which results in a short time from extremely violent effort; there is the fatigue, which may be called exhaustion, which overcomes the body when an effort of more moderate intensity is continued for a long time. Both of these may be defined as muscular. Then there is the kind which we may describe as due to wear-and-tear of the body as a whole, to blisters, soreness, stiffness, nervous exhaustion, metabolic changes and disturbances, sleeplessness, and similar factors, which may affect an individual long before his muscular system has given out. Of these three forms of fatigue the first one only is as yet susceptible of exact measurement and description. The second type may quite possibly come within the range of experiment at no distant date. The third type is still so indefinite and complex that one cannot hope at present to define it accurately and to measure it. Undoubtedly, however, all these types of what we call "fatigue" influence—indeed, determine—the results which are to be presented.

PRESENTATION OF DATA.

The data will be exposed in graphical form, and in every case the quantities plotted are the speed as ordinate and the time, or some function of the time, as abscissa. The reason for taking the time occupied in a race as one of our variables is simple; the problem before us, physiologically speaking, is, clearly, *how long can a given effort be maintained?* The length of time is given by the abscissa as the independent variable; the magnitude of the effort, or some function of it, as represented by the speed (that is, by the average speed over the race considered), is given as ordinate. It will be shown below, as Kennelly indicated in his paper, that the ideal way to run a race, possibly not from the point of view of winning it, but certainly from that of breaking the record for the distance, is to run it at constant speed. In those performances which have attained to the dignity of a world's record it is unlikely that this criterion has been to any very large degree neglected. Apart, therefore, from the fact that there is no speed of which we have any record except the average speed, we are probably not far wrong in using the average speed as a fairly exact measure, or at any rate as a function of the effort involved.

In one case only (Fig. 4) the time occupied in the race has been given on a logarithmic scale; no great virtue attaches to the logarithm, but if 75 yards and 100 miles are to be shown on the same diagram in a readable form it is necessary somehow to condense the abscissæ at the longer times.

RUNNING AND SWIMMING: SHORTER TIMES.

In Fig. 1 all the important world's records are presented, average speed against time, for men and women running and for men and women swimming. The crosses representing men rowing in an 8-oar boat will be discussed later. It is obvious in all four cases that we are dealing with the same phenomena, a very high speed maintainable for short times, a speed rapidly decreasing as the time is increased and attaining practically a constant value after about 12 minutes. There are no reliable records, in the case of swimming, for times of less than about 50 seconds, so that the curves cannot be continued back as far as those for running. There can, however, be no doubt that the curves for running and swimming are essentially similar to one another and must depend upon the same factors. In running, starting inertia is the cause of the initial upward trend of the curves; a maximum average velocity is attained in the case of men for about 200 yards, of women for about 100 yards; after that a rapid decrease sets in, ending only when the time has become 10 or 15 minutes, the distance two to three miles. The phenomena shown in Fig. 1 are susceptible of a fairly exact discussion.

OXYGEN INTAKE, OXYGEN REQUIREMENT,
AND OXYGEN DEBT.

In recent papers my colleagues and I have tried to emphasise the importance of a clear distinction between the oxygen intake and the oxygen requirement of any given type and speed of muscular effort. When exercise commences, the oxygen intake rises from a low value characteristic of rest to a high value characteristic of the effort undertaken. This rise occupies a period of about two minutes; it is nearly complete in 90 seconds. The oxygen used by the body is a measure of the amount of energy expended. One litre of oxygen consumed means about five calories of energy liberated, enough to warm 5 litres of water one degree Centigrade—expressed in mechanical energy, enough to raise about one ton seven feet into the air. It has been established, however, that the oxygen need not necessarily be used during the exertion itself. The muscles have a mechanism, depending upon the formation of lactic acid in them, by which a large amount of the oxidation may be put off to a time after the exercise has ended. The recovery process, so called, is a sign of this delayed oxidation; it is just as important to the muscle as recharging to an electrical accumulator. The degree,

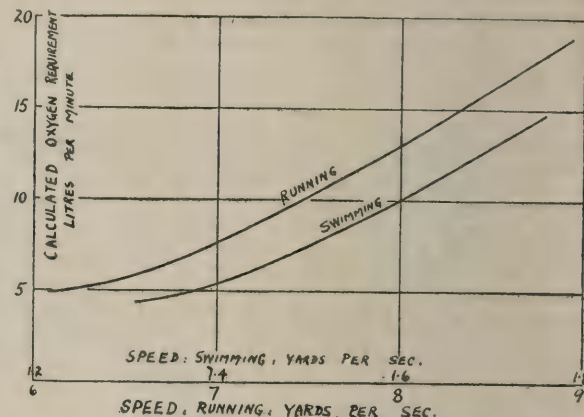
however, to which the body is able to run into debt for oxygen, to carry on not on present but on future supplies, is limited. When an oxygen debt of about 15 litres has been incurred the body becomes incapable of further effort; it is completely fatigued. In anything but the shortest races our record-breaking athlete should finish with something near a maximum oxygen debt, otherwise he has not employed all his available power, he has not done himself full justice. The maximum effort, therefore, which he can exert over a given interval depends upon the amount of energy available for him, upon (a) his maximum oxygen intake (that is, his income), and (b) his maximum oxygen debt (that is, the degree to which he is able to overdraw his account). These maxima are fairly well established for the case of athletic men of average size—about 4 litres per minute for the one, about 15 litres for the other.

It is possible for a man to make an effort far in excess of any contemporary supply of oxygen. This effort will require oxygen afterwards, and the total oxygen needed per minute to maintain the exercise can be measured. It is what we call the "oxygen requirement" characteristic of the effort involved. Now experiments have shown that the oxygen requirement varies very largely with the speed; it increases far more rapidly than the speed, more like the second or third power of the speed, so that high speeds and intense efforts are very wasteful. These facts enable us approximately to deduce the general form of Fig. 1.

Imagine an athlete with a maximum oxygen intake of 4 litres per minute,¹ capable of running until his maximum oxygen debt has been incurred of 15 litres. If he runs for 15 minutes the total oxygen available during the exercise and in arrears is $15 \times 4 + 15 = 75$ litres; an effort can be made requiring 5 litres of oxygen per minute. Imagine, however, that he exhausts himself not in 15 but in 5 minutes; the total oxygen available during or in arrears is $5 \times 4 + 15 = 35$ litres. He may exert himself more violently, there-

oxygen are available, 11.5 per minute; a correspondingly greater effort can be made. By such calculations it is possible from Fig. 1 to deduce a relation between oxygen requirement and speed. Taking the case of a man swimming, the result is

FIG. 2.



Oxygen requirement, running and swimming, of record-breaking athletes, calculated from curves of Fig. 1, on the assumption that at the end of a race the performer is completely exhausted, having attained his maximum oxygen debt. Maximum oxygen debt assumed = 15 litres for both. Maximum oxygen intake assumed: For running = 4 litres per minute; swimming = 3.5 litres per minute. Method of calculation described in the text.

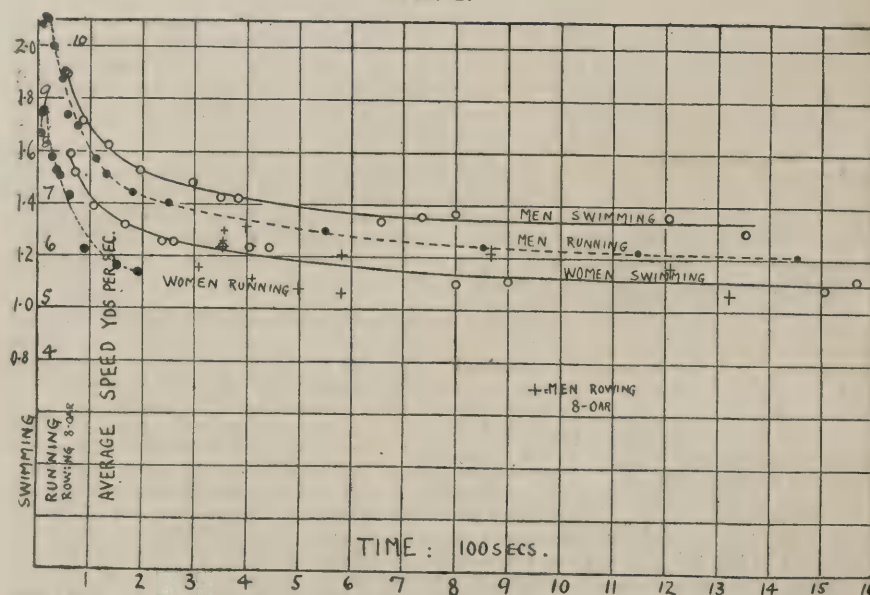
shown in Fig. 2 on the assumption of a maximum oxygen debt of 15 litres, a maximum oxygen intake of 3.5 litres per minute, and the supposition that at the end of the race the performer is completely exhausted. A similar calculated curve is given for the case of

running, on the hypothesis of a maximum oxygen debt of 15 litres and a maximum oxygen intake of 4 litres per minute. There can be little doubt that the factors here described are the chief agents in determining the form of the curves given in Fig. 1.

LIMITS OF THE ARGUMENT.

It is obvious that we must not pursue the argument too far. A man cannot exhaust himself completely in a 100 or a 200 yards race; even 300 yards is not sufficient to cause an extreme degree of exhaustion, though a quarter-mile, in the case of a first-class sprinter, is enough, or almost enough, to produce complete inability to make any immediate further effort. We have found an oxygen debt of 10 litres even after a quarter-mile in 55 seconds. It is obvious, therefore, that we cannot pursue our argument below times of about 50 seconds, that the maximum speed is limited by quite other factors than the amount of energy available. It is not possible in any way to release energy explosively for very short intervals of effort; other factors determine the maximum speed, factors mechanical and nervous. Neither can the argument be applied to very long

FIG. 1.



World's records for men and women swimming and running; average speed in yards per second against time in seconds. Note.—The scale for swimming is five times as great as for running. The observations for men rowing an eight-oar boat are on the same scale as running and are referred to later in the text.

fore, with an effort equivalent now to 7 litres per minute. Imagine next that he runs himself to exhaustion in 2 minutes: $4 \times 2 + 15$ —i.e., 23 litres of

¹ Assumed, for the sake of simplicity in calculation, to commence as soon as the race begins. For a more accurate calculation the gradual rise of the oxygen intake at the beginning of exercise can be taken into account.

races, where—as we shall see below—other types of exhaustion set in.

COMPARISON OF MEN AND WOMEN: SWIMMING AND RUNNING.

There are certain characteristics of these curves which are of interest. In the first place those for men and women are almost precisely similar. For a given time of swimming the maximum speed for a woman appears throughout the curves to be almost exactly 84 to 85 per cent. of that for a man. The curve relating oxygen requirement to speed, in the case of swimming, is not known from experiment, nor are the maximum oxygen debts and the maximum oxygen intakes known for women with any certainty. It would be very interesting to determine them were volunteers forthcoming. If we assume what is roughly true, that the energy expenditure rises approximately as the square of the speed, we may conclude that a woman swimming is able to exert, per kilogramme of body-weight, about 72 per cent. of the power expended by a man. Women are well adapted to swimming; their skill in swimming is presumably just as great as that of men; the difference in the maximum speed for any given time can be a matter only of the amount of power available.

In running, the same type of comparison may be made, though here not over the same range of times. For anything but the shortest races the maximum speed of a woman is almost precisely 79 per cent. of that of a man running for the same time. For very short times, 5 to 10 seconds, the ratio is greater—namely, 84 per cent. Here, again, there would seem little reason to attribute the difference of speed, at any rate for the longer races, to anything but a difference in the maximum amount of power expendable over the period in question. Assuming again, as an approximate means of calculation, that the energy used per minute varies as the square of the speed, we see that a woman running is able to liberate in a given time only about 62 per cent. of the energy expendable by a man of the same weight. It is probable that this ratio between men and women, as determined by swimming and by running respectively, is really the same in either case, and that the apparent difference depends upon an inexactness in the simple laws we have assumed for the variation of energy expended with speed. It would seem fair to take the mean of these two values, 67 per cent.—that is, about two-thirds—as the ratio of the amount of energy expendable by a woman in a given time as compared with that by a man of the same weight. It would be of great interest—and quite simple—to test this deduction by direct experiment on women athletes.

MEN AND WOMEN JUMPING.

A further interesting comparison between men and women may be found in the records of high jumps and long jumps. The world's record long jump for a man is 25.5 feet, for a woman 16.9 feet. The high jump records are respectively 6.61 feet and 5 feet. At first sight, when compared with running, these records for women seem extraordinarily poor; the high jump is only 75.5 per cent., the long jump only 66 per cent., of that for men. Such a conclusion, however, rests upon a misunderstanding, almost like that which makes many people believe that if a man could jump as well as a flea he could easily clear the top of St. Paul's Cathedral. It is a matter only of elementary mechanics to show, on the assumption that a woman can project herself vertically with a velocity proportional to that with which she can project herself horizontally, the constant of the proportion being the same as for the case of a man, that both the high jump and the long jump in the two sexes should be in the ratio *not of the velocities but of the squares of the velocities*. The maximum range and the maximum height of a projectile vary as the square of the velocity of projection. Thus it is right to compare, for men and women, not the height of the high jump or the distance of the long jump, but the square roots of these quantities, if we wish to study their relative

performance in jumping as compared with running. This being so, we find that the high jump of a woman, as measured by its square root, is 87 per cent. of that of a man²; the long jump, measured in a similar way, is 81.5 per cent. These compare closely with their relative performances for very short times of running, where a woman, as shown above, can run 84 per cent. as fast as a man. It is amusing to find simple mechanics explaining such apparent differences between the sexes.

SKILL.

Some people are much more skilled than others. To a large degree, of course, the skill and grace associated with athletic prowess is natural and inborn; to a large degree, however, it can be produced by training and breeding. All the movements required in the violent forms of muscular exertion here discussed are rapid ones, far too rapid to be directly and continuously subject to the conscious intelligence; they are largely, indeed mainly, reflex, set going by the will but maintained by the interplay of proprioceptive nervous system and motor apparatus. The nature of muscular skill cannot be discussed here; possibly, however, above all other factors it is the foundation of athletic prowess. Such skill has a physiological basis as it has a psychological aspect. It is a fit subject for discussion alike by physiologists, psychologists, students of physical training, athletes, masters, and workmen. The further study of skill is likely to be most fruitful in many branches of human endeavour. Given incorrect adjustment due to lack of skill, given imperfect timing of the several parts of the mechanism, given unnecessary movement and vibration, the whole system will be inefficient. Fundamentally the teaching of athletics for anything but the shortest distances consists in training the performer to carry out the same movements at a given speed for a smaller expenditure of energy.

BICYCLING AND HORSE-RUNNING.

Not all forms of muscular exertion are so violent, involve so great an expenditure of energy, when carried out at the highest speed, as running and swimming. In Fig. 3 are two examples of this fact, horse-running and bicycling. For horse-running a long succession of records on American horses are plotted on the topmost curve; below are the records of men bicycling, the unpaced professional records, made not in a race but against time. Most bicycle races are useless for our purpose. The competitors proceed in groups, trying one to ride behind the other to avoid wind resistance, and the speed may be absurdly low. Paced records are of little value because the efficiency of the wind-screen provided by the pacing apparatus is not standardised. These professional records, however, made unpaced, simply with the intention of breaking the record, are probably reliable, and they form a reasonably smooth curve. Plotted on the same diagram for comparison is a curve to represent a man running, a replica of that of Fig. 1. The first two curves are on twice the scale of the third, since a running horse and a bicycling man can go about twice the speed of a running man. It is obvious at once that neither of these two curves falls anything like so rapidly as does that of a running man; fatigue does not so soon set in; the amount of energy expended at the highest speed must be much less than in a running man. This conclusion, indeed, is obvious to anyone who has tried to ride a bicycle fast. It is impossible to exhaust oneself rapidly on a bicycle; the movements are too slow, they involve too little of the musculature of the body; it would require some minutes to produce by bicycling a state of exhaustion easily attainable within a minute by running. The curve for horse-running is almost parallel to that for bicycling; presumably, therefore, the movements of a horse are so arranged that the extreme violence of effort possible in a human "sprinter" is unattainable. Possibly the

² It would really be fairer to compare the heights jumped, less the initial heights of the centres of gravity, say 3.1 feet and 2.8 feet respectively. This gives $2.2/3.51 = 0.63$ as the ratio of the heights, of which the square root is 0.79, a close agreement with the long jump.

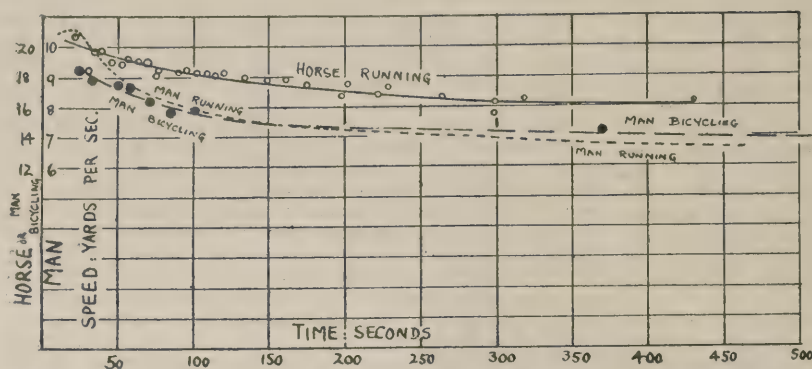
movements are too infrequent, or the qualities of the horse's muscles are so different, that the kind of fatigue rapidly attainable in man is not possible in the horse; possibly the horse will not "run himself out" so completely as a man.

BICYCLE ERGOMETERS.

The curves of Fig. 3 are of interest in connexion with the numberless experiments which have been made

being employed, as stated above, for the purpose of including all records from 75 yards to 100 miles in the same picture. That people think, to some degree, in logarithms, although unconsciously, is shown by the fact that the records which men have thought it worth while to make are distributed approximately uniformly over the picture from left to right. Fig. 4 presents the data of athletics perhaps more clearly than any other. The initial rise of the curve for men running, which is due to starting inertia, is very obvious. The rapid fall beyond 220 yards is clearly seen. It is obvious that the 100 and the 220 yards ($\frac{1}{4}$ mile) records are better than those lying in their neighbourhood, that the quarter-mile record is extremely good, the 500 yards record very bad, by comparison with its neighbours. This diagram should enable any enterprising and scientific athlete to select the records most easy to break. Let him try those for 120 yards, for 500 yards, for three-quarter mile, for three miles, but not for 200 yards, quarter mile, one mile, and six miles.

FIG. 3.



Records for horse running and man bicycling; dotted curve for comparison, man running, taken from Fig. 1. Horizontally, time in seconds; vertically, average speed yards per second. Note.—The horse and the man bicycling are shown on half the scale of the man running. The records for bicycling are the unpaced professional records against time. The records for horses were made in America.

with bicycle ergometers. Nearly all the laboratory observations on man, in connexion with muscular exercise, have been made with that implement. It has been obvious to my colleagues and myself during the last few years that the types of exercise chiefly adopted by us, running and standing-running, are more exhausting and require a far greater expenditure of energy than those employing the bicycle ergometer. In rowing and in pedalling a bicycle it may not be possible to attain respiratory quotients of 2 or more during or shortly after exercise. After running, or standing-running, however, very high values are attained, due to the fact that these latter forms of exercise, at the highest speeds, are so very much more energetic than the slower movements of rowing or bicycling. It is speed and frequency of movement which determine the degree of exhaustion produced by it. To exert a powerful force in a moderate rhythm is not anything like so tiring as to exert a much smaller force in a frequent rhythm; hence the reason for "gearing up," as in the bicycle and in the long oars of a rowing-boat.

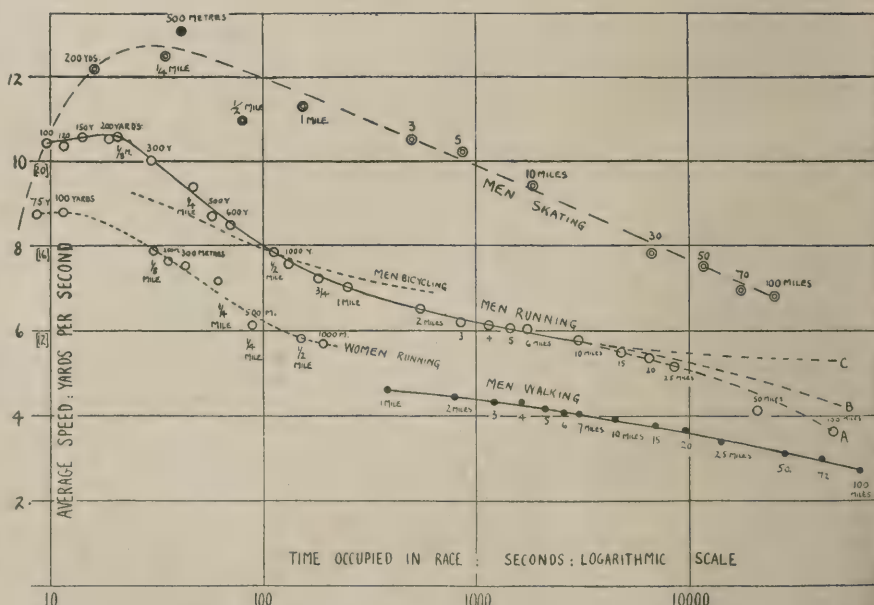
[After a further illustration from English horse racing the lecturer proceeded to a consideration of the last diagram, Fig. 4.]

THE LOGARITHMIC GRAPH.

There average speed in a race is plotted against the logarithm of the time occupied in it, the logarithm

towards the right of the diagram; this fall represents the initial factor in fatigue. On the logarithmic scale, however, where the longer times are compressed together, the curve continues to fall throughout its length. This later fall is due to

FIG. 4.



Records for men skating, bicycling, running, and walking, and for women running. Horizontally, logarithm of time occupied in race; vertically, average speed in yards per second. The same scale is used throughout, except for bicycling, where half the scale is employed, as shown in square brackets. The curve for men running appears to be somewhat doubtful beyond 10 or 15 miles, and three alternative curves are shown by broken lines.

factors quite different from those discussed above. Consideration merely of oxygen intake and oxygen debt will not suffice to explain the continued fall of the curve. Actually the curve beyond 10 miles seems to some degree doubtful. Apparently the same extent of effort has not been lavished on the longer

records. The greatest athletes have confined themselves to distances not greater than 10 miles. The curve A drawn through all the points has a suspicious downward bend in it, which suggests that if Alfred Shrubbs or Nurmi had tried to break the longer records they would have done so very effectively. Possibly the true curve lies more like the continuation C; possibly it may be intermediate as shown at B. It would seem doubtful, indeed, whether the running curve and the walking curve are really to meet at about 150 miles. The most probable continuation of the running curve would seem to be somewhere between the lines B and C.

The continued fall in the curve, as the effort is prolonged, is probably due to the second and third types of fatigue which we discussed above, either to the exhaustion of the material of the muscle, or to the incidental disturbances which may make a man stop before his muscular system has reached its limit. A man of average size running in a race must expend about 300 g. of glycogen per hour; perhaps a half of this may be replaced by its equivalent of fat. After a very few hours, therefore, the whole glycogen supply of his body will be exhausted. The body, however, does not readily use fat alone as a source of energy; disturbances may arise in the metabolism; it will be necessary to feed a man with carbohydrate as the effort continues. Such feeding will be followed by digestion; disturbances of digestion may occur—other reactions may ensue. For very long distances the case is far more complex than for the shorter ones, and although, no doubt, the physiological principles can be ascertained, we do not know enough about them yet to be able further to analyse the curves.

WOMEN'S RUNNING RECORDS.

The women's curve, as far as it goes, is very similar to the men's. Some records again are better than others. An enterprising woman athlete who wants to break a record should avoid the 300 metres; she would be well advised to try the 500 metres. It would be very interesting to have an intermediate point between 100 and 200 yards.

BICYCLING AND WALKING.

As before, the curve for men bicycling, which is drawn on twice the scale vertically of the running curves, is far less steep than they are. The conclusion from this was emphasised above. The walking curve is interesting—it is approximately straight. Physiologically speaking, there is not much interest in the shortest walking races, since here walking is artificial and extremely laborious; running at a considerably higher speed is much more easy. For longer distances, however, say from 10 miles onwards, we have probably in walking the most reliable data available for long-continued muscular effort. If we wish to study the exhaustion produced by exercise of long duration, walking-men may well provide the best subjects for our experiments.

SKATING.

There remains the top curve of all, that for men skating. The initial rise of the curve, due to starting inertia, is very obvious. The fall of the curve beyond the maximum is nowhere near so rapid as for the case of running. Clearly in skating a man is not able to exert himself with the degree of ardour that is possible in the more primitive exercise of running. Skill and restraint are necessary, as they are in bicycling. There are limits to the output. Moreover, the effort can be continued for a long time at comparatively high speeds. It is interesting to note that a man can skate 100 miles at almost the same speed as another man can run one mile. The curve falls uniformly throughout as does the walking curve. Clearly the phenomena of gradual exhaustion could be well investigated in the case of skating. Here, again, it is obvious which records the aspiring athlete should attempt to break.

ROWING.

There are only a few records available, and those lying between rather narrow limits, for the case of

rowing. Taking the case of an eight-oar boat, I have been able to obtain very few reliable data. Kennelly gives records of crews rowing, for times from 305 to 1210 seconds. Yandell Henderson, in the *American Journal of Physiology* (vol. lxxii., p. 264, 1925), gives five observations made upon the Yale crew of 1924. In addition there are records for the Henley course; these, however, are usually contaminated by the speed of the water. The most reliable of the data have been plotted in Fig. 1 on the same scale as the running, on five times the scale of the swimming. The observed points, shown by crosses, are somewhat scattered. As far as they go, a mean curve through them would lie practically along the curve for women swimming, but, of course, on five times the scale. The interesting part of the curve to the left is lacking; it is obviously impossible to make observations on an eight-oar boat for periods of 20 seconds, starting inertia is too great and no result of any value could be obtained. It would, however, be of interest to obtain data as far back as possible; certainly the records of crews rowing in still water for a minute and above should be ascertainable, and they would help to fit rowing into the scheme outlined by the other types of muscular effort.

WORK AND STROKE FREQUENCY IN ROWING.

In rowing the movements are slow; in an eight-oar boat, from 30 to 40 strokes per minute. According to observations by Lupton and myself the maximum efficiency of human muscular movement is obtained at speeds of about one maximal movement per second. In rowing, experience and tradition alike suggest that such a speed is about the optimum. In an eight-oar boat the recovery takes almost as long as the stroke, both occupying about one second. It is of interest how practical experience has gradually evolved a speed of movement which is almost exactly what a physiologist might have predicted as the most efficient. At a stroke of about 32 per minute the mechanical efficiency is apparently near its maximum. An enormous amount of work has to be done in propelling a boat at speeds like 10 to 12 miles per hour. According to Henderson, each member of the crew of an eight-oar boat must exert about 0.6 of a horse-power. Clearly if this enormous amount of external work is to be done it must be accomplished by working under efficient conditions. Those conditions necessitate a stroke of a particular frequency; only when the race is very short is it permissible, in order to obtain a greater output, to work less efficiently by adopting a more rapid stroke. The stroke may rise to 40 per minute for a short distance; in such an effort the oxygen debt is accumulating rapidly and exhaustion will soon set in. The amount of work, moreover, will not be proportionately greater, probably only slightly greater, than at the lower frequency. The conditions which determine the speed of movement, the "visco-elastic" properties of muscle, are what ultimately decide the length of the oars and the speed of movement in a racing-boat. It is interesting to find—as, of course, was really obvious—how closely athletics is mixed with physiology.

WASTEFULNESS OF HIGH SPEEDS.

This last discussion leads us to the question of what determines the great wastefulness of the higher speeds. Why does a speed of 280 steps per minute require 24 litres of oxygen per minute, while a speed of 240 steps per minute requires only eight litres of oxygen? The answer depends upon the variation of external work with speed of muscular movement. In a series of recent papers it has been shown that in a maximal muscular movement the external work decreases in a linear manner as the speed of shortening increases. At sufficiently high speeds of shortening no external work at all can be performed. In most of these athletic exercises, apart from the case of rowing, a large proportion of the mechanical work is used in overcoming the viscous resistance of the muscles themselves. At high speeds of running only a small

fraction of the mechanical energy of the muscles is available to propel the body once the initial inertia has been overcome. The speed of shortening is so rapid that little external work can be done. The work is absorbed by internal friction, or by those molecular changes which, when the muscle is shortening rapidly, cause its tension to fall off. When working against an external resistance, as in rowing, there is an optimum speed. If an effort is to be long continued it must be made at a speed not far from the optimum. When, however, the whole of the resistance to movement is internal, as in running, there is no optimum speed; the expense of the movement increases continually as the speed goes up; the faster we move, the greater relatively the price. Our footsteps are dogged by the viscous-elastic properties of muscle, which prevent us from moving too fast, which save us from breaking ourselves while we are attempting to break a record.

UNIFORM SPEED IS THE OPTIMUM.

The amount of energy required per minute to run or to swim, or, indeed, to propel oneself in any way, increases more rapidly than the speed—in the cases which have been investigated, approximately as the square of the speed. This mathematical relation is not exact. From the variation of energy output as the square of the speed, we can immediately deduce that the most efficient way in which to run a race is that of a uniform speed throughout. Imagine that a man runs a mile race in 4 minutes 30 seconds at a uniform speed of 6.52 yards per second. His energy expenditure is proportional to $4\frac{1}{2}$ times 6.52 squared—that is, 191.3 expressed in some arbitrary units. Imagine now that he runs it at two speeds, 6 and 7 yards per second, 780 yards at the lower, 980 at the upper speed. The total time is the same; the energy expended, however, is slightly greater, 192.3 instead of 191.3. This small variation of speed in the race has produced no serious increase in the energy expenditure. Let us imagine, however, that one portion of the race, 665 yards, is run at 5 yards per second, while another portion, 1096 yards, is run at 8 yards per second. The total time occupied in the race is still 4 minutes 30 seconds. The energy expended, however, is greater—namely, 201.5 units. Even this, however, is not a very large increase; by running about half the time at 8 yards and half the time at 5 yards per second, the energy expended has been increased only about 5 per cent., as compared with that required for running at a uniform speed of 6.5 yards per second throughout. Although, therefore, theoretically speaking, the optimum fashion in which to run a race is that of uniform velocity throughout, comparatively large variations on either side of this velocity do not appreciably increase the amount of energy expended.

POSSIBLE ADVANTAGES OF A FAST START.

There may, indeed, be advantages in starting rather faster than the average speed which it is intended to maintain. The sooner the respiration and circulation are driven up to their maximum values the greater will be the amount of oxygen taken in by the body, the greater the amount expendable during the race. It is a common practice in mile races to start very fast and to settle down later to the uniform speed. This may have a physiological basis in the quickening up of circulation and respiration achieved thereby.

THE SIMPLE MECHANICS OF HIGH-JUMPING.

One final point may be worthy of mention—this time connected with high-jumping and long-jumping. Recently I made a series of observations, with a stop-watch reading to 0.02 seconds, of the times occupied by a number of high-jumpers from the moment they left the ground to the moment they reached the ground again. With men jumping about 5 feet the time averaged about 0.80 second. Calculating from the formula

$$S = \frac{1}{2}gt^2,$$

where t is half the total time of flight, the distance

through which the centre of gravity of the body was raised must have been about 2.5 feet. The men competing must have had an original height of their centre of gravity of about 2.7 feet. Thus, in the high-jump, their centres of gravity went about 5.2 feet high into the air. They cleared a height of 5 feet; they just managed to wriggle their centres over the bar. Now, paradoxical as it may seem, it is possible for an object to pass over a bar while its centre of gravity passes beneath; every particle in the object may go over the bar and yet the whole time its centre of gravity may be below. A rope running over a pulley and falling the other side is an obvious example. It is conceivable that by suitable contortions the more accomplished high-jumpers may clear the bar without getting their centres of gravity above or appreciably above it. Let us calculate, however, on the assumption that the centre of gravity of a jumper just clears the bar. The world's record high-jump is 6.61 feet, the centre of gravity of the performer being presumably about 3 feet high at rest. He raises it therefore 3.61 feet into the air, from which we may calculate that the whole time occupied in the jump is about 0.96 second. Seeing the amazing complexity of and the skill involved in the rapid movements and adjustments involved in a record high-jump, it is striking that all those events can occur within a time of less than one second. All the characteristics of the proprioceptive system must be evoked in their highest degree in carrying out such a skilled, rapid, and yet violent movement.

LONG-JUMPING.

It is well known to athletes that success in long-jumping consists in learning to jump high. It is not, of course, the case that a record long-jumper performs at the same moment a record high-jump. He must, however, cover a very considerable height. The world's record long-jump is 25.48 feet. With the check provided by the vertical impulse in the last step we cannot well imagine the horizontal velocity to be greater, at this moment, than that of 100 yards completed in 10 seconds—that is, than 30 feet per second. Let us assume this value. Then the performer remains in the air for $\frac{25.48}{30}$, that is, 0.85 second. Hence we may calculate that the vertical distance covered is about 2.9 feet. Assuming the centre of gravity of the subject to have been originally 3 feet high, this means that it must have reached a height 5.9 feet in the air, enough, in a high-jump, to enable its owner to clear 5.9 feet. It is interesting to find that the simple laws of mechanics emphasise so strongly the precepts of the athletic trainer. Not only must one jump high if one wishes to break a long-jump record, but one must bring one's centre of gravity nearly 6 feet high into the air; for one must project oneself vertically, so that one may remain for 0.85 second above the ground.

CONCLUSION.

The practice of athletics is both a science and an art, and, just as art and science are the most potent ties tending to draw men together in a world of industrial competition, so sport and athletics, by urging men to friendly rivalry, may help to avert the bitterness resulting from less peaceful struggles. If, therefore, physiology can aid in the development of athletics as a science and an art, I think it will deserve well of mankind. As in all these things, however, the reward will be reciprocal. Obviously in the data of athletic records we have a store of information available for physiological study. Apart from its usefulness, however, I would urge that the study is amusing. Most people are interested, at any rate in England and America, in some type of sport. If they can be made to find it more interesting, as I have found it, by a scientific contemplation of the things which every sportsman knows, then that extra interest is its own defence.

SOME

Practical Considerations**IN THE CONSERVATIVE TREATMENT OF FRACTURES OF THE PELVIS AND LOWER EXTREMITY.****A Course of Four Lectures delivered for the University of London at St. Bartholomew's Hospital*BY SIR WILLIAM I. DE COURCY WHEELER,
M.D. DUB., F.R.C.S. IREL.,

PAST PRESIDENT, ROYAL COLLEGE OF SURGEONS IN IRELAND.

LECTURE III.*

FRACTURES ABOUT THE KNEE-JOINT.

FRACTURES of the lower end of the femur into the knee-joint are not uncommon. They resemble closely articular fractures of the lower end of the humerus. The condyles may be comminuted, or there may be simple fractures through either condyle. Replacement of the fragments usually takes place under extension. A Thomas knee-splint, applied in the classical fashion, is the best apparatus for the purpose. Traction on the tibia pulls the condyles into correct position by the tension of the lateral and crucial ligaments. By separating the joint surfaces during treatment adhesions are prevented and early move-

Reduction is accomplished by strong flexion until the heel touches the buttock, combined with traction on the tibia and direct manipulation. In order to save the limb open reduction may become necessary. Union usually takes place by bone, and is followed by some shortening and interference with growth. The injury should be treated in full flexion, as in similar fractures involving the elbow-joint. In the latter case the triceps, with the limb in flexion, provides a nicely grooved natural splint for the prevention of backward displacement and, in the case of the knee-joint, the quadriceps extensor when the limb is flexed forms a naturally moulded anterior splint which admirably controls the fragments and prevents forward displacement.

In epiphyseal separation of the lower end of the femur the limb, after reduction, should be carefully watched lest anything in the nature of tight bandaging or tight compression produces swelling of the feet. The condition of the circulation in children, when firm fixation is required, needs strict attention. "Look well to the blood-supply of the limb below the point of injury, more especially in all fractures of the lower extremity," is the advice of Bryant and Buck in the "American Practice of Surgery" (Vol. III.).

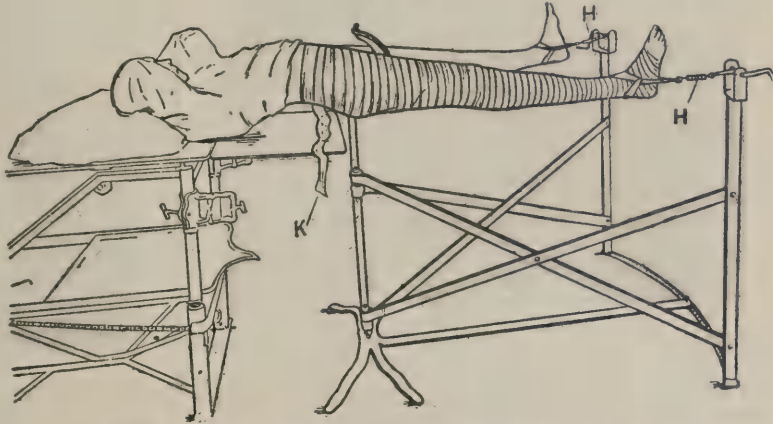
Traction by Pins, Callipers, and Stirrups.

Before dealing with the treatment of mal-union and non-union after fracture of the femur, it is necessary to refer to the question of extension applied by means of metal appliances attached to, or passed through, the bone. These appliances consist of various pins, callipers, and stirrups; each surgeon

FIG. 1.

Positions for transfixion-pins.
(Hey Groves.)

FIG. 1A.

"Gate" extension apparatus (reproduced from THE LANCET,
August 22nd, 1925, p. 364).

ments facilitated. Stretching of the ligaments during treatment does not produce any permanent disability.

It is best for the surgeon to manipulate the condyles with his hands while the assistant is applying extension in these cases. "So long as the tibia is not allowed to bump up against them," says Sir Robert Jones, "they will not be again displaced. If immediate reduction does not occur, quite often after a 12 hours' extension on the Thomas splint the displaced fragment will find its proper position." Fractures of the tuberosities of the tibia and T-shaped fractures into the joint are dealt with in the same way. About six weeks after these injuries the patient may move about on a calliper splint.

Epiphyseal Separation.

The lower fragment is usually displaced forwards, and the ragged end of the upper fragment is pushed backwards in relation to the popliteal vessels. The injury is sometimes compound, and in many recorded cases amputation has become necessary.

has his preference for one or the other. The transfixion pin is the only one I myself employ, and quite often it takes the form of a long nail, such as is used for the temporary fixation of joints after excision. The skin is pulled upwards towards the hip to prevent subsequent traction pressure on the skin below the pin. The point of election for transfixion is just above the condyles at their junction with the shaft. If a pin is driven through the compact tissue of the femur at the point indicated, it can be left in place without inconvenience or pain for from six to eight weeks. A handle improvised from wire is attached to the pin. In the cases I have treated I have passed the pin through the tibia, not the femur. It is passed through the shaft of the tibia just behind and below the tubercle. In this position the bone is thick and hard, and the pin can be left in position for two or three months (Fig. 1).

In the case of fractures of both bones of the leg, when this form of extension becomes necessary, the pin is passed by some surgeons above, but in the line of, the malleoli, well clear of the ankle-joint, about three finger breadths above the tip of the external malleolus. Personally, I prefer transfixion of the

* Lectures I. and II. appeared in THE LANCET of August 15th and 22nd respectively, and Lecture IV. will appear in a subsequent issue.

os calcis. The pin is passed one inch below and behind the tip of the external malleolus, downwards and inwards in such a way that traction produces inversion of the foot.

Full information on this subject is to be found in

FIG. 2.



Mal-union of femur (lower third) three months after the injury. $3\frac{1}{2}$ inches shortening. (Lateral view.)

the excellent work on "Modern Methods of Treating Fractures," by Hey Groves.

MAL-UNION AND NON-UNION.

Mal-union and non-union are due, probably in 90 per cent. of cases, to mal-treatment. They are a reproach to surgery, and can always be avoided. It is no use blaming constitutional disease, or the interposition of soft tissues between the fragments for these unpleasant sequelæ. The primary treatment is practically always at fault, and is thus the main causative factor. The primary treatment may be good, but if the patient is allowed to bear weight too early, yielding of the callus with angulation and overlapping will take place.

The time of strong union in a fractured bone varies in almost every case, and the length of time given for solid union in the text-books never errs on the safe side. In a small percentage of cases twice as much time is required as in a typical case. To allow walking without a calliper splint in the case of a fractured femur before three months have elapsed is asking for trouble, and under certain conditions a much longer period is required. Cases of non-union are often unrecognised cases of delayed union, and the dividing line between the two is very obscure. For some reason or another union is slow, and at the end of five or six weeks the surgeon becomes anxious, and moves the fragments one upon the other; in

another four or five days he tries again, and, by a continuation of this process, it is made impossible for the slowly-forming permanent callus to complete the union.

The treatment of definitely ununited fractures must,

FIG. 3.



Position after two extensions on "gate" apparatus and traction from a pin through the tibia. The injured leg is now longer than normal.

of course, be operative, but the surgeon should feel morally certain that it is a case of non-union, and not delayed union, before operation is undertaken. In this matter I have tried to follow the teaching of Sir Robert Jones. His usual practice is simply to begin again and wait, and to try and induce osteogenetic activity by Thomas's so-called "percussion and dam" method. After hammering the whole region of the fracture with a padded or indiarubber mallet, a tight elastic band is applied both above and below the fracture at a distance of several inches. The limb between the tubes swells to much more than its normal girth, expanding all the capillaries and lymph paths in the fibrous tissue, and allowing a new process of repair to start. The indolent callus may thus be transformed into an osteogenetic factory. The rubber tubes can be worn only for about 20 minutes each day at first; afterwards they can be borne for several hours at a time. They should be kept tied sufficiently tightly to produce considerable swelling and stasis. Local congestion between two tubes is much more effective than when one proximal tube is used. There is no doubt that non-operative treatment should be tried in cases of apparent non-union, in the hope that they are cases of delayed union. Only when efficient

conservative treatment fails should the case be condemned as one of non-union. Bone-grafting and reconstruction operations are then undertaken.

It is surprising what good results can be obtained in cases of mal-union of the femoral shaft with 3 in. or 4 in. shortening. Even after three or four months it is not difficult to re-break the fracture manually. In most of the cases I have seen the knee was stiffened by the previous treatment, and the mal-union could be broken down by forcible bending of the knee over the edge of the table. The worse the position of the bones, the less firm will be the exuberant callus. In old-standing cases of mal-union it may not be possible to re-fracture a bone, and the simplest method to employ is an oblique osteotomy through the callus between the original fragments of the shaft.

When the mal-united fracture has been re-broken and thoroughly freed manually, forcible extension by some means or another will reduce the shortening at one sitting by from 2 in. to 3 in. It has been my practice, after re-fracturing the bone, to forcibly stretch the limb for a few minutes on the gate apparatus (Fig. 1A), and while still stretched to apply a Thomas splint with fixed tape extension. While

over a pulley at the end of the bed; 20 lb. weight is at first employed, but with this arrangement of pulleys, apart from friction, the resultant weight is equivalent to 40 lb. This pin or calliper traction takes the place of the fixed extension. If, in a week's time, the shortening has not been completely corrected, the patient is brought to the theatre, anaesthetised, and the limb again stretched on the gate apparatus. It is seldom necessary to repeat the process more than once, and quite often the treatment will result—if not carefully watched—in the leg becoming too long (Figs. 2 and 3).

I have had in my Private Hospital during the last year a man, aged 70, whom Mr. Hey Groves kindly saw with me. He fractured the lower third of his femur when in a state of alcoholic exuberance, and did not think seriously of treatment for three months after the accident. The lower fragment was in the usual position behind; the upper fragment impaled the soft tissues at the outer side of the patella like a bayonet, and there was over 3½ in. shortening. Three months had elapsed, but there was no difficulty in breaking down the fracture by manipulating the knee over the edge of the table. The first stretching on the gates reduced the shortening by 2 in. For a week he was treated in fixed extension in a Thomas splint. Shortening to the extent of 1½ in. persisted, and further forcible

FIG. 4.



Late or secondary displacement. After six weeks the splints were removed in order to fit a calliper with the result shown. The patient never left bed.

the limb is stretching on "the gates," and before the tapes are tied to the end of the Thomas splint, a nail or pin is passed through the tibia, as recommended by Hey Groves, just behind and below the tubercle. When the patient is back in bed a pulley is connected by a strong wire loop to the nail. When the patient returns to the ward a cord is tied to the end of the Balkan frame, is brought round this pulley, and passed

FIG. 5.



Same case as Fig. 4 showing femur ½ inch too long after "gate" extension (see Fig. 1A) and pin traction.

extension on the gates was employed. The shortening was this time completely reduced. With the assistance of Mr. Hey Groves, a pin was passed through the strong portion of the tibia in the region of the tubercle, and 40 lb. extension applied when the patient returned to bed. The weights were gradually reduced after the first fortnight to about 15 lb. Two months later the injured limb was found longer than the other.

Late or Secondary Displacement.

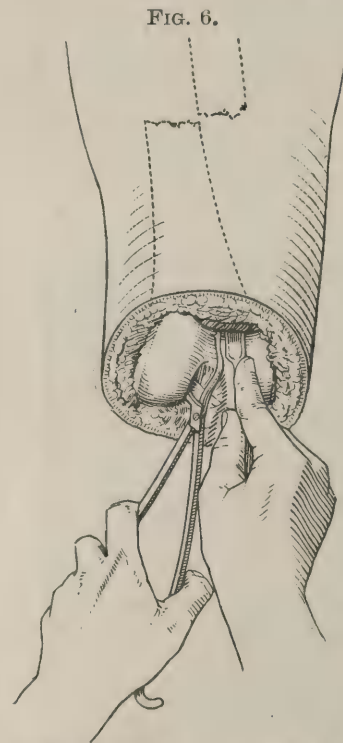
With calliper or pin extension, over-lengthening of the bones may be produced more readily than when other methods are employed. Care must be taken lest deformity recur after two or three months, owing to the plastic condition of the intervening callus, even though the patient is still kept in bed. There should be no interval between the removal of the extension and the application of a calliper splint. The latter should be worn both night and day for a considerable period. In the case just mentioned, the full length obtained and the good alignment were partially lost by allowing the patient to lie for a couple of days after two months without the extension. The final result was functionally

good, with about $\frac{1}{4}$ in. shortening.

I had experience of another case, in which a transverse osteotomy was performed in the lower third in order to correct outward rotation of the foot following gunshot injury to the hip (Figs. 4 and 5). A Thomas knee-splint was used for fixation, but was removed at the end of five or six weeks in order to fit a calliper. Before the latter was completed lateral displacement and overlapping of the fragments occurred, although the patient never left bed. This was subsequently corrected by re-breaking, stretching on the gates, and pin traction. After consolidation it was found that the leg had been lengthened by $\frac{1}{2}$ in. beyond normal.

This question of late or secondary displacement requires some attention. It was new to me until

Sleeve amputation. The limb is removed by circular amputation and the bone shelled out in the manner shown.



recently, and I used to think of it as occurring only when patients were allowed to walk too soon without support. In both the cases to which I have alluded, the broken ends were held in good alignment, but in the first there was not close apposition, and a large gap remained to be filled up with reparative material. Such repair tissues undergo ossification in the adult very slowly, and probably at the end of six or eight weeks they are quite plastic. In a day or two the muscular tension may slowly deform the seat of fracture, so that the final result is very far short of that which was promised by X rays in the course of treatment. Hey Groves comments on this, and states that late displacement is specially liable to occur in the femur of adults.

One would hardly think it possible that an interval of a few days without apparatus, while the patient is still in bed, after six or eight weeks of extension, would lead to shortening and displacement, but that such may occur—especially where the treatment was for mal-union or where too much lengthening has been produced—is beyond doubt.

Amputation after Fracture of Femur.

Although I am dealing here with conservative treatment, I must mention that I have had four

cases of fractured femur, in private practice, which ended in amputation. In three out of the four the limb was removed by a procedure I have called the "sleeve" amputation (Fig. 6). It is a modification of the discarded guillotine operation, and appears to me to be applicable to a group of cases in which orthodox methods would result in needless mutilation.

The method is designed to meet certain emergency operations with the least possible surgical risk, and with a view to the conservation of the longest possible stump. The orthodox method of obtaining healthy flaps well above the injury or disease is departed from, and the amputation is carried very much lower than most text-books would sanction.

I will quote one case by way of illustration:—

In 1916 a man was run over by a motor lorry and sustained a fracture about the middle of the shaft of the right femur. Ten days afterwards he was seen by me. The leg, from the foot to just below the knee, was gangrenous: the thigh was enormously swollen, red, and cedematous; the skin was mottled and vesicated, and large patches of black and purple discoloration extended over a wide area. The thigh had all the appearance of the early stages of moist gangrene which had already destroyed the leg. The cedema, vesication, and discoloration extended upward on the abdomen. A tourniquet could not be employed owing to the condition of the soft tissues, and for the same reason digital compression of the vessels was impossible.

An incision was made exposing the upper portion of the femoral artery for a length of 2 or 3 inches in order to ascertain its condition. The artery was pulsating at this level, and was held by an assistant between finger and thumb. A circular amputation was quickly performed through the knee-joint, just above the line of definite gangrene. The incision was carried above the margin of the patella in front, and the quadriceps extensor tendon divided. The attachments of the soft tissues to the femur were separated with knife and periosteal elevator until the lower segment could be withdrawn, like a cork from a bottle, by the rotatory movements of a heavy bone forceps. When the assistant released the femoral artery there was no bleeding whatever at the end of the stump. At this level the vessels were thrombosed and obliterated. The lower half of the thigh had now the appearance of the sleeve of a coat from which the hand and forearm had been removed. The sleeve was left open and lightly packed with iodoform gauze.

The man made an uninterrupted recovery, except that there was an extensive sloughing of the skin in the upper portion of the thigh. He was seen in August, 1923, seven years after operation, and was walking without pain or discomfort with his artificial leg. A scar about the size of the palm of a hand in front and above indicated where the skin sloughed and had been skin-grafted. The scar through which the femoral artery was exposed was well seen on the inner side. An X ray photograph showed irregularities about the end of the femur, and the formation of well-marked osteophytes. Owing to the adequate

FIG. 7.



Stump some years after a sleeve amputation for compound fracture of the femur in the upper third.

covering of soft tissues, these gave rise to no pain or discomfort whatever.

Fig. 7 shows the stump some years after a sleeve amputation for comminuted compound fracture of the upper third of the femur, the result of a bullet wound. Before amputation the soft tissues were riddled with discharging sinuses.

CATARACT EXTRACTION IN EGYPT.*

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In a country such as Egypt, where trachoma is endemic and affects about 90 per cent. of the population, the preparation of cases as a preliminary to the extraction of cataract is an important matter. It is not the presence of the trachoma itself which is the danger, but the coexistence of such organisms as the pneumococcus, streptococcus, staphylococcus, Morax-Axenfeld bacillus, Koch-Weeks bacillus, and gonococcus, which has to be negatived before operation can be considered as safe.

The appropriate treatment for the particular stage of trachoma found in each case is adopted, and treatment is continued until the conjunctival secretion becomes innocuous.

Preparation of the Patient for Operation.

It is sometimes exceedingly difficult to get rid of dangerous organisms from an eye preparatory to operation. Where this is not possible after treatment as an in-patient for a fortnight, and where the conjunctiva is fairly smooth, we proceed with the operation, after having swabbed the conjunctiva with silver nitrate solution, 2 per cent., an hour previous to the operation. I have never seen any untoward occurrence after this procedure.

In order to overcome the nervousness which many patients feel when suddenly introduced into the completely strange atmosphere of the operation room, it is an invariable practice to put the patient on the operating table the day before the operation and teach him to look at his own hand, being the opposite one to the eye to be operated on, held up in front of him. At the operation a nurse holds up the patient's hand upon which the patient himself fixes his gaze. In this way we avoid telling the patient to look down to his feet, together with the consequent dangers of this procedure. The skin of the area surrounding the operation is painted with tincture of iodine; the orbicularis is then infiltrated with novocaine solution, 1 per cent., above and below the palpebral fissure; this greatly helps in keeping the patient quiet, and I have had far fewer unruly patients since I carried this out.

When the patient is placed on the table the conjunctiva is bleached with adrenalin chloride solution, and then the conjunctival sac is thoroughly flushed with lotion from an irrigator above the level of the patient's head. The fluid used in Egypt is invariably freshly prepared surgical eusol solution, made from bleaching powder which has been kept in an air-tight receptacle; unless this smells strongly of chlorine it is inert, and only useful by its mechanical effect. It is not dangerously irritating to the bleached and anaesthetic conjunctiva.

As I have been talking mainly of hospital patients I have omitted to mention the massage of the lids to get rid of excess of Meibomian secretion, which I practise for private cases a day or two before the operation. I have found it advisable but not always easy to get this carried out in hospital practice.

The Operation as Usually Performed in Egypt.

In describing to you the variety of cataract operation which is usually performed in Egypt, or was being

performed while I was still Director of Ophthalmic Hospitals, I must remind you that I was invited to occupy that post in order to teach ophthalmology, including especially the operative side, to Egyptian surgeons, and not in order to perform an immense number of operations myself. It has therefore been my object to fix in the minds of my pupils, by usually practising it, what I considered to be the safest operation for the average operator. I have naturally had opportunities of performing most of the different operations, but the operation which I now do is, I consider, the safest both for myself and my pupils. I think that each operator should do that operation which suits him best, and which he can do in the least time, with the least possible damage to the tissues. Certainly since my return I have seen some beautiful operations performed by other surgeons by very different methods. In any case the surgeon must be ready to alter his procedure to suit the exigencies of the case.

I open the lens capsule with a Dalrymple's cataract needle which has a perfectly cylindrical shaft, without escape of aqueous. I make a fairly large section, including a small conjunctival flap. I then remove the speculum and deliver the lens, depressing the posterior border of the wound with a curette, and just touching the lower part of the cornea with the concavity of a strabismus hook. During this manoeuvre the lids may be separated by the assistant with a strabismus hook under the upper lid, and his thumb on the lower lid. I frequently wash out the anterior chamber with normal salt solution which has been filtered and boiled immediately previous to the operation to remove soft cortex. Some years ago I had bad results after washing out the anterior chamber, but none since I have attended to the preparation of the solution myself. I use a syringe with a flat silver nozzle in preference to any apparatus which requires an assistant. A button-hole iridectomy in the periphery of the iris is then performed, the iris forceps used being straight and without teeth.

I believe that the presence of the intact iris is a great safeguard against rupture of the hyaloid membrane and consequent loss of vitreous during delivery of the lens. I prefer to make a button-hole iridectomy rather than to leave the case as a simple extraction, as I think that there is less liability to prolapse of the iris when there is an aperture in it through which aqueous can escape, in case the anterior chamber reopens. The intention to leave intact the pupillary border of the iris is also guided by the desire to prevent the possibility of the prolapse of capsule into the wound rather than by the desire to obtain a better cosmetic effect. I have no hesitation in doing a complete iridectomy if the iris does not seem to go back easily into the anterior chamber on irrigation; at all times I prefer to do this if there is a reasonable probability of prolapse occurring subsequent to the operation. A drop of atropine solution is instilled and both eyes are bandaged. A metal shield of some kind is placed over the dressing. At every dressing the strictest aseptic precautions are observed, as regards the surgeon's hands, the sterilisation of the dressings, and of the atropine drops. Carelessness in this respect is invariably punished sooner or later by signs of inflammation. I find that old patients with bronchitis or restless people usually remain much quieter if they are taken from the operating room and placed in a deck chair with a pillow under the head, than if they are put to bed and told not to stir under penalty of losing the good effect of the operation. I remove the pad from the eye unoperated on at the first dressing. I flush the conjunctival sac with antiseptic drops and after drying them up instil a drop of atropine solution daily. Dark glasses are given between the sixth and tenth days.

By whichever method the capsule is opened, whether by the point of the knife, capsule forceps, the needle, or the cystitome, a number of cases will require discission of capsule subsequently. If the membrane is really anterior lens capsule it may be needed at any time after vascular congestion has

* Read at the Ophthalmological Section of the Royal Society of Medicine.

disappeared. I have made a practice of needling such capsules ten days after the operation of extraction, provided that there is no redness. It must be very distinctly stated that the needling operation which I do is a very delicate affair, and consists in a single cut or tear of the membrane with a Dalrymple's needle. If an aperture is produced all is well, but if an aperture is not produced, either through clumsiness or through the membrane being thicker than was expected, no more is done, and it is dealt with on a subsequent occasion, as soon as all redness has disappeared. I occasionally use a Zeigler's knife, or a fine Graefe's knife, or more rarely two needles.

Sometimes one sees cases in which, owing to inflammatory conditions after the extraction, or owing to proliferation of the cells of the anterior capsule, the capsular membrane is thick and difficult to divide without causing dangerous traction on the ciliary body. I have no doubt that such cases are best dealt with by capsulotomy with de Wecker's scissors, an opening into the anterior chamber having been made with a keratome. I expect to do such operations without loss of vitreous. This operation should never be performed until a period of three months has elapsed since the last sign of inflammation in the eye disappeared.

In Egypt, where there is so much acute conjunctivitis with resultant corneal ulceration and disintegration of the globe, shrunken globes are very common, and one is frequently asked to extract a cataract in an eye which is fairly healthy otherwise, but in which the fellow eye is in a condition of phthisis bulbi. Now, as a matter of clinical experience, it is found that intra-ocular operations in a fairly good eye are frequently followed by iritis if the other eye is shrunken; also that sympathetic ophthalmia is a not unusual occurrence in a patient who has had a perforating ulcer of the cornea with prolapse of iris. I therefore invariably refuse to operate on the cataractous eye until its fellow, being in a condition of phthisis bulbi, has been removed.

I have not mentioned the importance of the routine examination carried out by the ophthalmic surgeon in charge of the hospital, all details being scheduled, including a note on the hæmoglobin percentage and the condition of the teeth. If the hæmoglobin is low, examinations are made for the ova of bilharzia, or ankylostoma, and if positive, the conditions are treated. Carious stumps are extracted by the surgeon, and if the frequent pyorrhoea alveolaris is present the gums are thoroughly swabbed daily for a period with tincture of iodine. Each cataract patient is given a toothbrush and is taught to use it with a solution of permanganate of potash. Before operation I always verify in the dark room the clinical notes made by the surgeon in charge of the hospital. My impression is that complicated cataracts are more common in Egypt, and it is easy for a surgeon of only two or three years' ophthalmic experience to miss an important sign, such as a faint tremor of the iris, which may be of the greatest importance to the operator or to the prognosis.

All cases of cataract extraction are examined and ordered appropriate glasses, if necessary at the Government expense. The fellahin, however, are usually satisfied with their unaided vision. If a patient does not come for examination he is sent for. In this way an exact record of the operative result is obtained. In order that each operator shall have a knowledge of his results it is insisted upon that he keeps a statistical record; this is also important for the purpose of clinical supervision.

Visual Acuity after Operation.

The visual acuity after cataract extraction in Egypt is usually poor as compared with that obtained in England. This is due to several reasons: First, the cornea is rarely clear, but has a leucoma, or nebula, or pannus; second, the intelligence of the patients in the country districts is frequently very undeveloped; and third, many even of the well-educated classes think it is bad luck to acknowledge how good their visual acuity after operation really is, though they

may readily say that they are very pleased with the result. Also many cases of cataract in which the cornea seems to be clear when examined in the dark room before operation exhibit opalescence at the first dressing, due, as I suppose, to a refilling of old pannus vessels.

Difficulties Encountered in Egypt.

The operation of cataract extraction seems to be more difficult in Egypt than in England. The acquisition of sufficient Arabic for operative purposes is not a difficult matter, though a very necessary one, the difficulty being in the inability of the patient to sustain for the duration of the operation the required pose and immobility. On looking through my private notes I find several cases in which this is exemplified.

Case No. 13808, operated on at Asswan on March 25th, 1911, was a Berberine woman who understood no Arabic; she moaned and squeezed, and kept her eyes turned up during the whole operation. She was discharged from the hospital a month later with a clear gap in the capsule; impossible to take her vision, but she is able to get about well without glasses.

Case No. 6682, operated on at Zagazig on Feb. 14th, 1915; the patient squeezed as soon as the section was completed, the lens shot out in its capsule followed by vitreous. Iridectomy was done and the wound was sutured.

Case No. 14809, operated on at Damanhur on June 29th, 1911. After normal delivery of the lens the wound began to gape; the patient then squeezed, allowing a large escape of vitreous; the wound was closed with the ciliary body in view. Six weeks later the vision with sph. +9 and cyl. +4 was 6/36; the usual pre-existing nebula was present, and there was a fine capsular membrane.

The operation which I was in the habit of performing at this time was extraction with iridectomy, the capsule being opened with capsule forceps.

Case No. 8350, operated on at Medina-el-Fayum on March 16th, 1918. I failed to open the extraordinarily thick capsule of a Morgagnian cataract either with the point of the Graefe knife as it went across the A.C. in making the section, or with the cystitome. I therefore inserted the toothed iris forceps into the A.C. with the intention of tearing the capsule; however, the capsule was too tough to be lacerated, and I slowly withdrew a bladder-like Morgagnian cataract without loss of vitreous. The vision a fortnight after the operation was 6/24 with correction, the usual pannus being present.

I have notes of nine cases between 1916 and 1923 in which the lens was extracted with Macnamara's cataract spoon without losing vitreous. This was done in each case because some particular danger threatened, and not as an operation of election. A typical case was the following:—

No. 5304 was operated on at Rod-el-Farag, Cairo, on July 22nd, 1923. Extraction of cataract in a glaucomatous eye; the wound had to be enlarged, as owing to the shallow A.C. it was impossible to make the section adequately large; the capsule was opened with the cystitome. On commencing delivery of the lens the vitreous bulged; the lens was therefore scooped with Macnamara's spoon without loss of vitreous. A fortnight later the eye was quite quiet, the pupillary area being occupied with thick capsule for needling.

Another case of interest to me was No. 9904, Assiut, on which I operated on Sept. 28th, 1912. I found at the first dressing on the following day that the conjunctivo-corneal flap (at this time I was in the habit of making only a very small conjunctival flap) was ante-flexed forwards on to the cornea. I therefore sutured it into position. Thick capsule was needed on Oct. 8th, or ten days after the extraction, after which the patient's vision with sph. +10 was 6/9.

It is certainly well to be prepared to suture the conjunctival flap in position if it shows signs of mal-apposition at the close of the operation. Recently I operated on a retired prize-fighter who exhibited signs of severe former injuries in a deflected nose and a pair of cauliflower ears. The cataract was about complete, while the other eye showed a posterior polar opacity, without, however, vitreous opacities. After section I opened the capsule with a cystitome and commenced delivery of the lens when vitreous protruded. I then did a complete iridectomy, and scooped the lens with slight vitreous loss. The wound gaped considerably so I put in two conjunctival sutures. At the first dressing in three days' time the eye was found to be perfectly quiet, but at the site of

the wound the conjunctiva was bulging. I took a depressed view of the case, but he was discharged from the hospital within a fortnight with a perfectly flat wound, a normal fundus as far as can be seen, and no vitreous opacities. To me this case was interesting, as if I had not had the necessary sutures and skilled assistance I believe that the eye would have been lost.

These cases with exceptional operative conditions are not often met with, but it is as well to be prepared for the worst.

Operation in a Glaucomatous Eye.

I have already referred to a case of extraction of a cataract from a glaucomatous eye. By this I mean either as a primary operation or as a secondary operation after a previous decompression operation. In Egypt it not infrequently happens that a lens which exhibits slight opacity rapidly becomes totally opaque after a decompression operation, which, as far as can be seen, has been perfectly performed, certainly in which no injury to the capsule of the lens can be detected. I suppose that some change in the nutrition of the lens must take place as the result of the reduction of tension, causing it to become opaque. I referred to this in my report for the year 1919 of the Ophthalmic Section of the Department of Public Health. I there gave details of ten such cases, all those on which I operated for this condition between December, 1909, and February, 1918. In no case was vitreous lost, and in seven of them useful vision resulted. During the same period 59 similar cases were operated on by my assistants with loss of vitreous in 8 cases, and resulting useful vision in 41 cases. It therefore seems that it is worth while attempting operation in such cases provided that even a small field only remains.

Forms Peculiar to Egypt.

There is a form of cataract found in children in Egypt which is rarely met with in England or in Europe. It is not congenital, for there is invariably a history of previous good vision, followed by a rather rapid diminution, over a period of two to six months. The condition is usually binocular, but monocular cases are sometimes seen, in which the healthy eye shows no sign of opacity. The condition has long been known to be associated with anaemia, but was first fully described by Granville Waddy in the *Bulletin* of the Ophthalmological Society of Egypt for 1914. The principal causes of anaemia are ankylostomiasis and bilharziasis, with which the disease pellagra is in severe cases sometimes associated.

Some of these cataracts contain little more than a milky fluid, so that after opening the lens capsule the opaque matter can be evacuated by paracentesis, leaving the lens capsule to be dealt with later by needling. Other lenses consist of gelatinous material which can be easily broken up with the cataract needle, and then evacuated at the same sitting through a keratome incision. More rarely the substance of the cataract resembles that of the normal lens, and should not be evacuated until the aqueous has had time to break down the lens fibres.

A moderate degree of anaemia seems to have no adverse influence on the prognosis of intra-ocular operations. Such operation wounds heal with extraordinarily little increased vascularity, and usually without the signs of iritis. The cause of the anaemia in ankylostomiasis has not been fully worked out. It is not due to haemorrhage from the intestine, or to ingestion of blood by the worms. It has been shown by Boycott and Haldane that the volume of the blood in ankylostomiasis is increased to double the normal, while the oxygen-absorbing power is about normal. It is probable, though it is not proved, that the worm secretes a toxin, which, being absorbed by the human host, causes inhibitory changes in the blood-formation of the red marrow. The severity of the anaemia is not always proportional to the number of worms present. The treatment of the disease has recently been revolutionised by the discovery of the vermicide properties of carbon tetrachloride.

THE INDUCTION OF PREMATURE LABOUR.*

A RECORD OF SEVENTY-TWO CONSECUTIVE CASES.

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History.

THE first record of an induction of premature labour is that by Louise Bourgeois, midwife to Marie de Médicis in 1608. In 1756 a conference was held in London to discuss the frightful mortality of Caesarean section, when Denman suggested induction of premature labour by rupture of the membranes as a therapeutic measure. Macaulay, of London, was the first to perform the operation on the wife of a linen draper in the Strand. In 1836 Kiwisch, of Wurzburg, introduced the method of induction by repeated douches of hot or cold water. In 1852 Barnes made use of an hourglass-shaped rubber bag with stopcock. In 1855 Krause introduced a method of induction by the insertion of a flexible bougie into the uterus. A few years later, in 1888, Champetier de Ribes's bag was invented, but could only be used after dilatation of the cervix. Small bags of very thin indiarubber were devised by Horrocks, of Guy's Hospital. Galabin approved this method, which he considered to be the most perfect, since it has the advantage, as compared with the use of the bougie, that there is very little risk of separating the placenta. The only difficulty is to get rubber bags made thin enough to dilate easily by hydrostatic pressure and yet strong enough not to burst.

Other methods, such as ecbotic drugs, separation of membranes from lower uterine segment, massage of breast or uterus, injection of glycerine between membranes and uterine wall, electricity, cervical tampons, have also all been used, but have nearly all been discarded with the exception of the quinine and castor-oil method, which is only successful in a small proportion of cases.

Propriety of the Operation.

The question of the propriety of the operation has been much discussed, more especially in cases of minor pelvic contraction. Williams thinks it has lost popularity in America owing to the high foetal mortality. He himself has only done one case. In 391 operations by Ahlfeld, Bar, Leopold, and Pinard the foetal mortality was 12 to 45 per cent., though the maternal mortality was only 1.03 per cent. They therefore held that it was no longer justified, and that equally good results for the mother, and far better for the child, would be obtained by subjecting the patient to the second stage of labour and resorting, if necessary, to Caesarean section. Kleinwachter concluded, after an exhaustive study of the subject, that 78.3 per cent. of children were born alive, but only 60.4 per cent. left hospital alive. He considered that probably half of these born alive would die during the first year owing to unfavourable environment. He thought the operation should be abandoned, except when the child is abnormally large from excessive development or undue prolongation of pregnancy. Sarvey, in 2200 cases, found a maternal mortality of 1.4 per cent., and 0.6 per cent. of this was due to infection, not necessarily due to manipulations. The infant mortality was 30 to 60 per cent. In the Queen Charlotte Hospital records in 10,000 labours there were 206 inductions. There was no maternal mor-

* A paper read at a meeting of the North of England Obstetrical and Gynaecological Society.

talities, but 26 infants did not survive—viz., 12.6 per cent. Von Herff records 120 consecutive prophylactic inductions by rupture of the membranes, with a foetal and infantile mortality of 20 per cent. In four years at the Liverpool Maternity Hospital (1916 to 1919), of 169 bougie inductions with no maternal mortality 171 children were born, with 25 foetal and neonatal deaths—viz., 14 per cent. Prof. H. Briggs recorded in 1922 a series of 159 conservative bougie inductions in minor degrees of contracted pelvis, or foetal over size, with eight stillbirths and five neonatal deaths—viz., approximately 8 per cent. Prof. Briggs regards induction favourably.

Most authorities, in discussing the induction of premature labour, state that the child requires greater care than a full-time child, and that the ultimate chance of life of the premature infant must be carefully considered. Prophylactic induction is most likely to be successful when pregnancy has advanced to the thirty-sixth week, and the conjugate of the brim measures at least 3½ inches. Some think labour should not be induced in a first pregnancy, but only with the history of previous difficulty or loss of child. The proper time must be determined by estimation of the relation between the size of the pelvis and that of the foetal head, and the operation should be carried out as soon as there is difficulty in pushing the head in (to allow for the reduction for moulding). Eden advocates an examination under anaesthesia for the measurement of the diagonal conjugate, and the determination of the relative sizes of the head and pelvis.

Methods of Induction.

With any method it may be difficult to excite effective uterine contractions. There is no doubt that in some cases there is a personal idiosyncrasy, as in one of the cases included in this series, in whom, in two consecutive inductions, five days elapsed before labour pains started.

In our series of cases we chose the method considered by Galabin to be the most perfect—viz., the thin rubber bag—which we have employed in the form recommended by Prof. C. G. Lowry, of Belfast—viz., the toy balloon—distended by sterile water. With this method there is less risk of rupturing the membranes than with the bougie, the normally situated placenta is not interfered with, and there is less risk of carrying sepsis into the upper portion of the uterus. The insertion of the hydrostatic bag imitates closely the natural onset of labour and interferes little with its normal progress. The thin toy balloon is easy to insert, and there is no need for preliminary dilatation. If not more than 16 ounces of fluid are used there is no over-distension of the lower uterine segment. With the thin rubber bag there is very little displacement of the presenting part. The balloon can be boiled, so there is less risk of sepsis than with a gum elastic bougie, which cannot be so efficiently sterilised. It does not project from the vagina, so there is no ladder for the ascent of organisms.

The use of an anaesthetic is not a disadvantage. Though not essential it enables the examination to be more completely satisfactory, and a higher degree of asepsis to be attained, and it helps to remove the principal difficulties in induction of premature labour—viz., the recognition of the case requiring it, and the choice of the correct time.

Technique.

A general anaesthetic is employed. The vagina is douched with 1 in 2000 biniodide of mercury lotion and the uninflated balloon introduced with bullet forceps through the cervix, which is fixed by means of a modified Collin's lung forceps. Sixteen ounces of sterile water are introduced with a piston syringe through tubing tied on a glass tube in the neck of the balloon. The tubing is tied and a gauze pack left in the vagina to keep the tubing from projecting. The balloon and its connexions should always be previously tested.

Cases of Induction of Premature Labour.

The present investigation comprises 72 consecutive† cases, which were under observation during the years 1923 and 1924 at the Liverpool Maternity Hospital and Maternity Home.

Seventy-four infants were born, including two pairs of twins. Of the 72 inductions, 30 were primigravidae and 42 were multigravidae. In 65 of these cases delivery was effected per vias naturales, while seven were delivered by Caesarean section.

In these 65 successful cases the average period of gestation was 38½th week (primigrav., 38½th weeks, multigrav., 38½th weeks).

The average weight of the children was 6 lb. 12 oz. (primigrav., 6 lb. 8½ oz.; multigrav., 6 lb. 14 oz.), and the average length 19.2 in.

The average time from induction until pains began was 8 hr. 20 min. (primigrav., 7 hr. 12½ min.; multigrav., 9 hr.). As a comparison, in four years (1916-19), in 169 bougie inductions at the Liverpool Maternity Hospital, the average time from induction until pains began was 24 hours, almost three times as long. With the balloon inductions the average time from induction until delivery was 29 hr. 17 min. (primigrav., 36 hr. 9 min.; multigrav., 24 hr. 31 min.).

In the Liverpool Maternity Hospital reports 1916-19 as above, the duration was 46.6 hours, which is nearly double. The average length of time from induction until pains began and until delivery was much prolonged by two cases, one a primigravida who had no true labour pains for 110½ hours, and a multigravida who had no true labour pains for 183½ hours. Excluding these two cases the average length of time from induction until pains began was 2 hr. 47 min. in the primigravidae (hospital cases) and 3 hr. in the multigravidae.

General anaesthesia was employed in all cases but two multigravidae with cardiac disease. The indications were: (1) a minor degree of pelvic contraction, 63 cases; (2) post-maturity and large foetus, 6 cases; and (3) maternal disease, 5 cases (3 cardiac, 2 toxæmias).

Pelvic Measurements.—In 41 cases there was a minor degree of general contraction, the diagonal conjugate averaging 4.4 inches. Eighteen of these cases were primigravidae with an average D.C. of 4.3 inches. Twenty-three were multigravidae, averaging 4.4 inches. The smallest D.C. in a primigravida was 3.8 inches. In 22 cases there was a minor degree of flattening, the D.C. averaging 4.3 inches. Nine of these were primigravidae, giving an average D.C. of 4.5 and 13 multigravidae giving an average measurement of 4.2.

Results.—1. Natural delivery took place in 52 cases. 2. Delivery by forceps in nine cases. 3. Delivery by Caesarean section in seven cases.

Forceps Cases.

- CASE.
2. P. Flat pelvis. D.C. 4½. R.O.P. Infant 6 lb. 12 oz.
 12. P. Second twin. Uterine inertia. Infant 6 lb. 4 oz.
 17. M. First induction failed. D.C. 4½. High forceps. Infant 6 lb. 2 oz.
 37. P. Prolonged second stage. Low forceps. Infant 6 lb. 1 oz.
 46. P. 134 hours before labour began. D.C. 4½. Mid. forceps. Foetal stress. Infant 7 lb. 8 oz.
 49. P. D.C. 4½. Prolonged second stage. Low forceps. Infant 6 lb. 12 oz.
 56. P. D.C. 3½. Hyperemesis. Haemorrhagic vomiting. *B. coli* infection. High forceps. Stiff pull. Child died of meningitis fourth day. No intracranial injury. Weight 6 lb. 1 oz.
 64. M. D.C. 4½. History of stillbirth and septicæmia. Toxæmia during pregnancy. Streptococci in urine. High forceps. Infant 9 lb. 8 oz.
 - 68a. P. D.C. 4½. Rigid cervix. Hydrocephalic infant with spina bifida. Stillbirth. Weight 4 lb. 13 oz.

Delivery by Caesarean Section.

20. P. D.C. 4½. Slight pains 4 days. No advance. Caesarean. Weight 6 lb. 12 oz.
25. P. D.C. 4. Pelvic presentation. No advance in 3½ days. Caesarean. Weight 6 lb. 7 oz.
31. M. D.C. 4½. Two previous forceps. L.O.P. Uterine inertia. Caesarean. 6 lb. 2 oz.
41. M. D.C. 4½. Flat. Four forceps. One previous induction at 37 weeks. Induction. Transverse lie. Caesarean section 23 hours after induction. Infant 7 lb. 2 oz.
44. M. Ten normal. 11th stillbirth. 12th lived one hour. 13th forceps. 14th balloon induction twice, followed by bougie induction. Uterine inertia. Caesarean section by Dr. Willett. 6 lb. 13 oz.
54. 2-gravida. Previous delivery of 8 lb. infant after balloon induction. D.C. 4½ in. Uterine inertia. Head remained above brim. Caesarean. Infant 7 lb. 2 oz.
65. 2-gravida. First child normal delivery of infant 6 lb. 2 oz. D.C. 4 in. Contracted outlet. Full dilatation. Head above brim. Weight 8 lb. 5 oz.

† In this series a fatal case of eclampsia where induction was done at the thirtieth week is not included.

Pelvic Presentations.

There were eight pelvic presentations, of which three were born normally, and one by Cæsarean section. There was difficulty with four cases.

CASE.

33. P. D.C. 4½. External version had failed. Delivered with difficulty of living child. Weight 7 lb. 3 oz.
 51. P., with slight contraction and premature rupture of the membranes. Uterine inertia. Balloon induction. Four hours later balloon expelled followed by infant with extended legs. Weight 5 lb. 7 oz.
 72. P. D.C. 4½. Extended legs and arms brought down with difficulty. Weight 6 lb. 10 oz.
 12. P. Twins. D.C. not reached. Difficulty with after-coming head. Stillbirth. Second twin forceps delivery. Weight 5 lb. 10 oz.

Malpresentations.—In one case already mentioned (Cæsarean section) a transverse lie occurred (Case 41). In another (Case 16) M., with previous difficult forceps delivery—after expulsion of balloon head remained high, hand and cord presenting, bag of membranes at vulva. Presentation was rectified under anæsthesia. Normal delivery 40 minutes later.

Results.

Mortality.—All the mothers survived. Of the 74 infants 72 were born alive—viz., all except the first twin in two cases, one being a hydrocephalic monster, and the other a pelvic presentation in a primigravida where there was difficulty with the after-coming head.

Neonatal Deaths.—1. One of meningitis (fourth day). 2. One of diarrhoea and vomiting (twelfth day). Breech. Weight 7 lb. 5 oz.

All the infants therefore but four—viz., 5.4 per cent.—left the hospital alive. Of the 70 living infants, 58 have been traced, and 55 are alive. Three are known to have died

in the first year: (1) Enlarged thymus, five months. (2) Convulsions and wasting, six weeks (breech). (3) Marasmus at three months. (This infant was the second twin to stillborn hydrocephalic infant) (also a breech). Of the 74 infants the ultimate known mortality is 9 per cent.

Morbidity.—Morbidity occurred in one mother (No. 64). This patient was a 2-gravida. D.C. 4½. The first child was a difficult forceps delivery with ruptured perineum which had not united, followed by septicæmia. Toxæmia with albuminuria was present during pregnancy. Induction was deferred on account of the history until 40½th weeks, when the size of the child made it imperative. The large child, 9 lb. 8 oz., was delivered alive by high forceps operation (Tarnier's axis traction). Antistreptococcal serum was administered, and a bacteriological examination of the urine taken before delivery revealed streptococci. The temperature remained high for a few days, but the patient ultimately made a good recovery.

Special Points.—With a balloon induction, as with any other method, it is especially necessary to eliminate the possibility of latent sepsis, of gonococcal or streptococcal origin. It is important for the nurse in charge to note whether the head is following the balloon, and if not to push it into the pelvis.

Conclusions.

That by the induction of premature labour in suitable cases a considerable amount of unnecessary suffering from prolonged labour due to minor pelvic contraction may be avoided. In addition, induction of premature labour is not so inimical to the child as published statistics maintain.

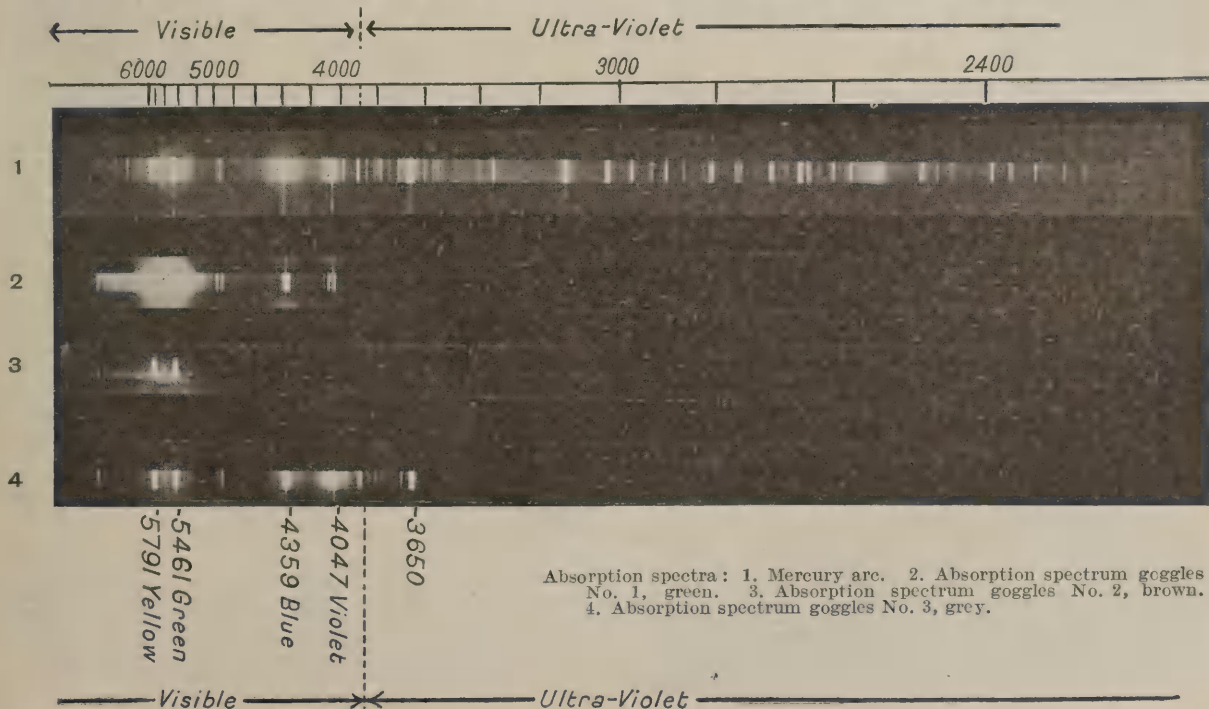
THE SPECTROSCOPIC EXAMINATION OF ULTRA-VIOLET GOGGLES.

BY B. D. H. WATTERS, M.Sc.,
 PHYSICS DEPARTMENT, MIDDLESEX HOSPITAL.

THE question of the quality of the goggles worn by operators when working in ultra-violet light is one which has scarcely received proper attention. These goggles have often to be worn for long periods, and they should transmit the maximum amount of the visible radiation, so as to allow the user to see the room and all apparatus, &c., perfectly clearly whilst every trace of ultra-violet is absorbed. Glass which fulfils both of these requirements is obtainable without

difficulty, but a number of the goggles sold for this purpose are fitted with very inferior glass which often falls short on both counts.

A specimen was examined recently, as the operator who had been using them complained of headache and eyestrain after quite a short exposure. On taking a photograph of the absorption spectrum on a panchromatic plate, in a quartz spectrometer, the cause of the trouble was at once apparent. (See Fig. 4.) This glass transmits a considerable portion of the ultra-violet spectrum to about $\lambda 3500$, thus allowing the intense mercury line at $\lambda 3650$ to pass with very little diminished intensity. At the same time the lines of the visible spectrum are partially absorbed, giving rise to the dark-grey colour of the glass. Not only are the goggles unnecessarily dark in



tint, but, what is much worse, a dangerous quantity of ultra-violet light is transmitted.

That radiation of this wave-length is harmful can easily be proved by isolating it by a suitable filter, when it is found to cause a most painful sensation in the eyes if the exposure is longer than a few seconds. At the same time it will be noticed that the eyeball fluoresces brilliantly.

The grey goggles were replaced by a pair of light-green tint whose absorption spectrum is shown. (See Fig. 2.) The difference is strongly marked. The yellow and green light which is so strong visually is transmitted almost without absorption, the blue to a less extent, and the violet still less. No trace of any radiation is to be recorded even by prolonged exposure beyond the limit of the visible spectrum. These goggles have proved very satisfactory in use—everything in the room was clearly visible, and all painful sensation in the eyes completely disappeared.

For purposes of comparison the spectrum of a third pair is included (See Fig. 3.) These were brown in colour and transmitted only the yellow and green of the visible spectrum, whilst a faint trace of the ultra-violet line $\lambda 3650$ will be noticed. The latter, however, is too weak in this case to have any perceptible effect. This pair of glasses may therefore be classed as not quite so good as the green ones, but probably quite efficient in use, and very much better than the original grey ones.

To summarise, it is clear that the mere visual examination of a pair of goggles is quite insufficient to indicate their suitability or otherwise for use in ultra-violet work—a spectroscopic examination is essential.

Clinical and Laboratory Notes.

A CASE OF SPONTANEOUS PNEUMOTHORAX. RAPID AND COMPLETE RECOVERY.

BY F. H. KELLY, M.B., B.S. LOND.

CASES of spontaneous pneumothorax, apart from those occurring in the course of active tuberculous disease of the lung, are not always characterised by a prolonged course or by a bad ultimate prognosis, as the following case shows.

The patient was a thin and slightly-built man aged 32. There was no history of previous illness, and he had served through the war without trouble. On the morning of Feb. 26th last he experienced sudden pain in the region of the sternum whilst stooping down after breakfast. He worked all day although the pain continued, and he had considerable shortness of breath.

Condition on Examination.—When seen for the first time on the 27th he had obvious signs of complete left pneumothorax. The left side was increased in size as compared with the right, but moved less. The percussion note showed increased resonance on the left side but was not tympanitic. The lower limit of resonance at the back was 2 in. lower on the left side than on the right. There was complete absence of vocal fremitus and vocal resonance on the left side. There was no cardiac dullness in the usual place, its left edge appearing to coincide with the right edge of the sternum. The apex beat could not be felt, but the position of maximum intensity of the heart sounds was exactly in the mid-line of the sternum. There was obvious dyspnoea even when lying in bed, and this was markedly increased by even gentle movement. The pain was not severe so long as the patient kept quite still.

Up to April 4th, on which day the patient was seen, there was practically no change in the condition of the chest. The left side became gradually a little less resonant, but was still distinctly more so than the right. At the back the lower limit of resonance was now only 1-1½ in. lower on the left side than on the right. The position of the maximum intensity of the heart sounds was still approximately in the middle line, but was a little difficult to locate owing to the development of a loud slapping extra-cardiac sound, due presumably to the forcing together of two pleural surfaces

by the heart's action. During this time the patient had gradually been promoted to getting up one hour a day, pain had disappeared, and dyspnoea was much less. The temperature, taken each evening at 6 o'clock, had never exceeded 98° F.

On April 6th, five weeks and four days after the onset, the cardiac dullness was found to be restored to its normal position, the apex beat was ½ in. internal to the nipple line, all the signs described above had disappeared, and in fact the chest appeared to be in all respects normal except that the breath sounds on the left side were not so good as on the right (this difference disappeared in a few days). The contrast from the condition only two days previously was amazing.

The subsequent progress of the case has been one of uninterrupted recovery. No abnormal signs have been found in the chest on either side and the patient appears now (June 15th) to be perfectly fit and well in every respect. He started work again a few weeks ago.

Hurstpierpoint, Sussex.

A CASE OF CHRONIC MENINGITIS LASTING FIFTEEN YEARS.

BY MARY HAMILTON WILLIAMS, M.B., B.S. LOND.,
D.P.H. CAMB.

THIS case is reported in order to suggest that there are more cases of intractable headache due to chronic germ infection of the meninges than is recognised.

Early History.—The patient, a married woman aged 55, had an early history of arrested pulmonary tuberculosis, malaria, and cerebro-spinal fever. A growth had been twice removed from the left antrum, and she had had a high degree of myopia. At the age of 40 the patient lost 3 st. in weight in less than a year, and this was ascribed to a probable recrudescence of tuberculosis. During this year she had attacks of partial loss of vision, occurring suddenly, and also saw flashes of white light, very brilliant, often appearing to resemble showers of falling stars. Sometimes the light was coloured and zig-zag. The flashes always appeared to the left eye. After one to two hours visual disturbance acute pain in the head set in. This was at first localised in the right occipital and parietal regions, and then diffused. There was also aphasia, nausea, acute photophobia, tenderness, and aching of the right cervical glands. During this year the patient lost two-thirds of her hair. The patient was examined by various consultants, who agreed that the trouble was probably tuberculous. Sir Victor Horsley diagnosed a meningitis 15 years ago, but considered it inoperable. The oculist diagnosed "typical migraine," and found bi-temporal limitation of fields of vision; fundus normal. These attacks at first occurred every six weeks, but gradually became more frequent.

Subsequent History.—As the years passed the patient lost strength, and any considerable fatigue brought on an attack. After an attack—not during—there was marked pallor of the face. Insomnia became very troublesome, whole nights being passed without sleep. There were also terrifying dreams. Either before or during an attack a period of extreme drowsiness would occur, lasting several hours, and not terminating in restful sleep. All possible means were tried to give sleep, as otherwise insanity would have been the termination. The patient continued to do brain-work, and did not consider that this tended to bring on an attack. But it was necessary to work in a warm room (70° F. for choice) and backing the light. Work which required lateral movements of the eyes—e.g., checking a catalogue—brought on pain. On waking in the morning, and sometimes during the night, there were jerky movements of arms, hands, legs, and feet. When the patient first drank in the morning there was sometimes acute pain at a special point which appeared to be about the cardiac orifice of the stomach, and the patient could not swallow until it passed.

After the attacks had continued during some five years it was noticed that before an attack there was frequently slight epistaxis, and during the attack there was constipation. After an attack ended pain was never again caused, for at least 48 hours, by exercise or exertion, which, at any other time, would have started pain with certainty. The temperature was always raised, being 99.4° in the morning and reaching 102° or higher on some nights. This was at the time ascribed to a recrudescence of tuberculosis. After about ten years had passed dyspnoea was first noticed,

and the pulse was slow, 70-76, even with pyrexia. The attacks gradually became more frequent, and the patient reached a condition when she was never free from pain for more than a few hours, and the insomnia and dyspnoea grew worse.

Two unusually severe attacks made it evident that, if operation was not possible, the patient's life would be short. In these attacks there were great drowsiness and agonising right occipital pain; flashing in the left eye, acute dyspnoea, the pulse-rate varying from 58-66, and intermitting seriously, with absolute insomnia. Plantar reflexes not detected; Kernig positive. There was some flashing in the right eye. A few days later there was definite extensor response to plantar reflex. An area of acute local tenderness was present over the right occipital area, and there was also slight oedema here, lasting some hours. On each of these two attacks, after the head pain had lasted some hours, severe stabbing pains set in in the shoulders and back. A peculiar sensation and thrill in the muscles was also present. In addition to the dyspnoea there was great air-hunger, so that the patient only breathed happily in front of a large open window.

The patient was taken to London and Mr. Donald Armour decided, despite the absence of definite localising symptoms, and at the express wish of the patient, that he would operate.

Definite extensor plantar reflexes were found which often varied from day to day. There was some oedema, as before, and it was considered that this and the localised pain would suffice for localisation. Sufficient bone was therefore removed from the right occipital and parietal regions to allow for access to the cranial contents. Considerable fluid was found outside the dura mater, with great bulging of the meninges, the dura being under high pressure. The meninges were three to four times as thick as normal, and this area was removed. The cerebro-spinal fluid escaped under high pressure. No sign of tuberculoma was found. The scalp was replaced, leaving a large area without bone.

On recovery from the anæsthetic the patient said she felt as if she could not breathe and it was necessary to keep an electric fan working close to her night and day. (In a recent report of a post-mortem on such a case I noted that there were numerous small hemorrhages found in the region of the vital centres in the medulla, suggesting a cause for air-hunger.) The condition took several days to pass off.

Post-operative History.—After the operation photophobia was extreme and brilliant white sheets of light lasting for hours were distressing. Unfortunately it had been taken for granted that the germ causing the meningitis was the tubercle bacillus, and therefore no cultures were made. Since the operation the patient is much improved, the elasticity of the scalp preventing dangerous degrees of pressure occurring, but the insomnia and pain became again troublesome towards the end of last year, and a vaccine was made from the post-nasal region, after a most exhaustive negative X ray examination of all the head region. Dr. L. G. Mackey found an infection of pneumococcus and influenza and from this made a vaccine. Only small doses can be used, but the patient is again improving, leading a busy working life.

An uneducated patient would have been unable to give the descriptions which here helped this diagnosis. "Migraine" is a diagnosis of a highly unsatisfactory character, and the causal germs need ascertaining.

Colwall, Malvern.

DONATIONS AND BEQUESTS.—By the will of the late Miss Elizabeth Jane Humby, of Hamilton-terrace, St. John's Wood, the testatrix left, among other bequests, £100 each to the Royal National Sanatorium for Consumption, Bournemouth, the Western General Dispensary, Marylebone-road, the Royal Medical Benevolent Fund, the Royal Medical Benevolent Fund Guild, St. Mary's Hospital, Paddington, the Middlesex Hospital, and the Church Army; £50 each to the London Fever Hospital, the Hospital for Epilepsy and Paralysis, the Paddington Green Children's Hospital, and King Edward's Hospital Fund.

CONTRIBUTORY SCHEME AT IPSWICH.—A contributory scheme is about to be started by the East Suffolk and Ipswich Hospital. It is proposed to include not only industrial weekly wage-earners, but also the clerical staffs in the factories, the employees of shops and offices, and the one-man trader. An agricultural contributory scheme has been in existence for the last six years, each farm-worker giving a penny a week with a similar amount from his employer. During the last 15 years members of the board of management have subscribed £45,000 for the enlargement, improvement, and maintenance of the hospital.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

THIS Section met on three days—Wednesday, Thursday, and Friday—Lady Barrett (London) occupying the chair.

WEDNESDAY, JULY 22ND.

MALIGNANT DISEASE OF THE PELVIC ORGANS.

Prof. B. P. Watson (Edinburgh), in an opening address on the

Problem of Cancer of the Uterus,

said that the toll this disease took of the population of the world was enormous, and although we did not know the cause, yet chronic irritation was so constantly present in cancer of the cervix that it must be recognised as one of the ætiological factors. Cervical cancer was ten times more common than uterine cancer, and it was essentially a disease of parous women. He thought that the incidence of the disease could be diminished (1) by avoiding all procedures likely to cause cervical lacerations at childbirth; (2) by the thorough treatment, and, if necessary, removal of the existing lesions. Women should be made to understand that long-continued leucorrhœal discharge indicated a diseased condition, and called for investigation and treatment. He considered that operations such as a plastic repair or amputation of the cervix were very simple procedures and devoid of risk. In his opinion the more extensive employment of these prophylactic measures at or about the menopause would diminish the incidence of the disease and early diagnosis would lessen the mortality. Prof. Watson emphasised the importance of teaching students the necessity of thoroughly investigating every case of irregular vaginal bleeding in women of all ages, nor should they be satisfied until cancer was definitely excluded. He maintained that it was only by this means that the early cases would be recognised.

The speaker then proceeded to discuss the relative merits of operative and radium treatment in cancer of the uterus. He had formed the opinion that in a clearly operable case of cancer of the cervix operation preceded by radium treatment offered the best chance to the patient, but in border-line and advanced cases radium treatment was the only one that held out any hope. In cancer of the body, however, he thought that operation offered a better chance than radium treatment. He held that wherever the disease, and whatever the treatment employed, the chances of cure were in inverse proportion to the duration of the symptoms. Prof. Watson finally made a strong appeal for a widespread educational propaganda to be carried on amongst the people in order that the cases might be seen early. He did not think it would unduly alarm the women of this country, for ten years' work among women on the other side of the Atlantic had convinced him that more good than harm resulted from such knowledge.

Mr. Victor Bonney then read a paper on the

Operative Treatment of Carcinoma of the Uterus.

He said that he welcomed the opportunity of speaking on the operative treatment of carcinoma of the uterus because he had no doubt at all that, up to the present time, it remained the treatment of election for the majority of cases. Dealing first with carcinoma of the cervix he reminded his hearers that here, as in every other variety of carcinoma, the growth extended itself in two ways—tissue infiltration and lymphatic permeation, and the line of operative excision must, therefore, be planned so that whilst at all points it kept outside the margin of growth by infiltration, it was extended in the regions of lymphatic permeation as far outwards as the anatomy of the parts and the endurance of the patient would permit. The operation which fulfilled these requirements was that introduced by the

Viennese gynaecologist, Wertheim. From 1907 to the present day he (Mr. Bonney) had performed Wertheim's operation about 300 times, but since no figures bearing on the subject were of any value unless grounded on the basis of five years' freedom from recurrence he dealt only with the first 192 cases of the series. These cases should be looked upon as the number he was able to operate radically upon, out of 303 unselected patients seen by him between the years 1907-20. With so high an operability rate it followed that in a large proportion of the patients the disease was well advanced, and in many cases very advanced. In general, the only bars to the accomplishment of the operation that he had recognised had been deep and extensive involvement of the bladder or the bowel, or involvement of both ureters to the extent of producing bi-lateral hydro-ureter. He had found what others practising the operation had found—namely, that in many cases it was impossible to determine whether the growth was removable or not, except by opening the abdomen. The operation as performed by him had always been as drastic and radical as he believed it possible to perform while giving the patient a good chance of recovery. The uterus and appendages, the whole or practically the whole vagina, together with the parametric and paravaginal tissue occupying the obturator fossæ and the glands along the external iliac vessels were removed. As regards the vagina, he had extended the operation of recent years; originally removing the upper half only he now removed it entire in most cases, because, next to the lymphatics which run out to the obturator fossæ, the vaginal wall was the most important line of march of the cancer cells. His results were as follows: Died of the operation, 32 (an operative mortality-rate of 16 per cent.); died of recurrent growth, 70; died of other disease, 5; lost sight of, 7; well after five years, 78 (that is 40 per cent. of the whole series, or nearly 49 per cent. of the cases recovering from the operation, or 25 per cent. of all the cases seen, reckoning his operability rate at 63 per cent.).

The operative mortality was high compared with that of ordinary operations of surgery, but he could have reduced it by performing a less drastic operation and by refusing to operate on the many "last chances" he had undertaken. The likelihood of recurrence was greatest in the first two years, and progressively diminished from then onwards. Five years' freedom from recurrence used to be considered an absolute cure, but unfortunately that was not quite true, as a certain small number of recurrences (about 3 per cent. of all recurrences) took place after five years, the latest among his cases being six and a half years. In regard to the 78 cases reported as "well" after five years, the accomplishment rate of the operation depended upon the point of view from which it was considered. Thus, reckoning for the present purpose all these cases as cures, then out of the 303 unselected cases of carcinoma of the cervix seen by him between 1907 and 1920 25 per cent. were cured. Lastly, taking only these cases that recovered from the operation, there were cured just on 49 per cent. of the 160 patients who recovered from the operations performed between 1907 and 1920. In 78 of the cases the glands removed at the operation were carcinomatous, and it had been argued that where this was found to be the case it was useless, or usually useless, to proceed with the operation. Although the outlook for cases with carcinomatous glands obviously could not be as good as for cases in which the glands were not carcinomatous, it was by no means hopeless; 25.6 per cent. of the 78 cases operated on were well after five years and 33.3 per cent. of the 60 cases recovered from the operation. He did not use radium beforehand as a routine, though he had operated on a good many cases in which it had been so used with the idea of making the growth removable. Those who said it could do this did not know the limits of operability. It did nothing of the sort, but on the contrary made the operation much more formidable on account

of the intense fibrosis set up which so welded the surrounding tissues to the growth that all planes of cleavage were lost and the separation of the bladder and ureters became a matter of great difficulty. Except in exceptional instances irradiation after the operation was not advisable, for the indiscriminate use of radiation without guide either as to direction or depth carried with it the very real danger of stimulating instead of killing any stray malignant cells that might have been left behind at the operation.

Turning to the surgical treatment of carcinoma of the corpus, Mr. Bonney said that the problem of diagnosing the disease must be given an important place. It was frequently necessary to explore the interior of the uterus under an anæsthetic, and even then it was sometimes impossible to scrape out anything worth microscopical investigation. Bleeding after the menopause should always be regarded as a menacing sign, and the likelihood of error should always be on the side of an interpretation too grave rather than too optimistic. The operation he performed was a free total hysterectomy, taking out the uterus, the vaginal vault, and both appendages, dividing the ovario-pelvic ligaments at the point where they take off from the pelvic brim. He only did Wertheim's operation in special instances. In his experience at least 50 per cent. of the patients recovering from operation were free from recurrence five years afterwards. This estimate was not based on accurate statistics, as he had not followed up these cases with the same thoroughness as in the case of those with cervical carcinoma.

Mr. S. J. Cameron (Glasgow) said that he intended to confine his remarks to

Cancerous and Sarcomatous Disease of the Ovaries and Cancer of the Fallopian Tubes.

He purposely omitted chorion-epithelioma and only briefly referred to the Krukenberg tumours of the ovary, which, in his opinion, were almost invariably secondary to cancer of the stomach. He based his paper on 94 unpublished cases. In his experience primary cancer of the ovary was much more uncommon than the secondary type, which, owing to its obtrusive size, had attention called to it, whereas the primary growth, being small and giving rise to no urgent symptoms, often remained unrecognised. Apparently the ovary provided a suitable soil for the implanted cancer cells, and, although it was generally accepted that the histological appearance of the secondary growth was the same as the primary, he had not always found this so. The speaker made a strong plea for the careful microscopic examination of all ovarian cystoma after removal, as a naked-eye examination might fail to reveal malignancy. The latter condition should always be suspected in a woman who had been in failing health for some time previously, and more especially if ascites were present. Sarcoma of the ovary was much less common than carcinoma, but the prognosis in either case was almost equally bad. Mr. Cameron drew attention to the difficulty of making an early diagnosis in these cases and hoped that Gye's recent work would make this possible in the near future. In referring to primary cancer of the Fallopian tubes, the speaker said that this condition was rare; he personally had only met with two cases. The diagnosis was difficult and the most prominent symptom was a copious watery discharge which might occasionally be blood-stained.

Discussion.

Mr. H. J. D. Smythe (Bristol) was interested to hear that Mr. Bonney now removed the whole of the vagina in Wertheim's hysterectomy. He agreed with Prof. Watson on the importance of the prophylactic treatment of cervical lesions, and stated that he always performed a pan-hysterectomy in these cases.

Prof. W. C. Swayne¹ (Bristol) said that Mr. Bonney had proved by his figures that the most radical

¹ The tragic death of Prof. W. C. Swayne was the subject of an obituary notice in THE LANCET of August 22nd, 1925 (p. 410).

operation in carcinoma of the cervix was the best. He agreed about educating the public, but thought that the propaganda could only be carried out by the general practitioner.

Prof. F. W. Marlow (Toronto) drew attention to the value of slow cauterisation of the growth as a preliminary to operation. The technique he employed was a modification of the Percy method. It was safer than radium as it removed the focus of infection.

Mr. Sidney Forsdike (London) said that he had never found any great difficulty with prophylactic radiation in cancer of the cervix. He would be interested to hear the methods and technique employed by Mr. Bonney in these cases.

Dr. M. Donaldson (London) strongly protested against the sweeping statements made by some of the speakers who opposed the use of radium, although it was obvious that they had had very little, if any, experience of its use. He pointed out that one of the speakers condemned radium after seeing a few patients who had been treated by applications which lasted less than 12 hours.

Mr. Leith Murray (Liverpool) pleaded for the better training of midwives, as they were often consulted before practitioners in these cases.

Replies.

Several other speakers took part in the discussion, and Prof. Watson and Mr. Cameron briefly replied.

Mr. Victor Bonney deprecated the criticism of the results he had obtained in cases in which the regional glands were carcinomatous, where radium was incapable of effecting a cure. The advocates of radiation would, no doubt, say that the carcinomatous regional glands could be treated by deep X rays, but his experience of this treatment, both for primary and secondary growths, was most disappointing. He had seen many cases in which the growth was certainly delayed, but never once had he seen a cure. In short, the only cure for cases in which the regional glands were malignant was operative removal, and this being so he saw no point in girding against the results of a treatment which, though very far from ideal, was yet the only treatment which held out any hope. He submitted that to have "cured" 25 per cent. of these cases was an unexpectedly great triumph. If it were possible to recognise before the operation those cases in which the glands were carcinomatous he would not adversely criticise the surgeon who considered that, as a group, they were not worth operating on, seeing that the risk of the operation was great and the chances of permanent cure relatively small. He should not agree with such a view himself, but it would be a matter of personal opinion which every surgeon would have to decide for himself. It was, however, impossible to make such a distinction not only before the operation, but even during the operation, for until the glands were removed it was, in many cases, impossible to say whether they were malignant or not.

No one was more anxious than himself to find a better method of treating carcinoma of the cervix than operation, but there was no sense in the advocates of radiation carping at the results of surgery until they had produced a series of figures comparable with those he had just put before them. It was no use trading on foreign sources for such figures: a study of the literature showed how entirely discordant they were. What was needed was the publication of a British series of not less than 100 cases treated by radiation, in all of which at least five years had elapsed between the date of cessation of all treatment and the date of publication. The interval that had elapsed since the cessation of all treatment was of prime importance. There was a great difference between keeping a patient alive with a carcinoma and curing a carcinoma. When such a series, produced from a reliable British source, gave a better cure-rate than he had obtained by operation, then he would immediately cease to operate any longer and hand over all his cases of cancer of the cervix to the radiologists.

THURSDAY, JULY 23RD.

Prof. James Heyman (Stockholm) opened a discussion on the

Treatment of Inoperable Cancer of the Pelvic Organs.

He said that he intended to set forth the result of his experience at the gynaecological department of the Radium-Hemmett, Stockholm, during the 15 years of its existence. This institution was founded by the Swedish Cancer Research Society for the radiological treatment of cancer cases referred from other hospitals. Radium treatment had been almost wholly restricted to inoperable cases, with the exception of cancer of the cervix, where the figures submitted in the first published report (1920) had been so striking that the leading Swedish gynaecologists had since that date ceased operating for this condition. The speaker claimed that he could report on 100 per cent. of the cases treated. This had been made possible by organised control of the patients and by the fact that owing to a special Act of Parliament the Swedish Government paid the travelling expenses of the poorer patients to and from the Radium-Hemmett.

Cancer of the cervix formed the most important group, and during the years 1914-22 inclusive they had treated 440 inoperable cases of this disease with radium. Of this number 243 had been under observation for five years or longer, 39 of whom remained free from symptoms. This gave a figure of 16.7 per cent. of permanent cures amongst cases which would otherwise have been regarded as hopeless. In addition two-thirds of the cases had regained sufficient strength to resume work and nearly half of these had remained at work over a year. Inoperable cancer of the body formed a smaller group than the preceding one and included those technically operable cases which, on account of old age and pronounced adiposity, rendered them unsuitable for operation. Out of 54 such cases treated with radium between the years 1915 and 1922 inclusive, 17 had been observed for five years or longer; of these 10, or 58.7 per cent., had remained free from symptoms. Inoperable cancer of the vulva and vagina had not reacted well to radium treatment, and results obtained from the treatment of ovarian carcinoma were disappointing. Six cases of cancer of the urethra were treated—the results were not good.

Prof. Heyman then briefly referred to the technique he employed and the methods of treatment adopted. He always used radium salts which were filtered through 3-4 mm. of lead, and as a rule only three applications were made. If possible radium was inserted at each of these treatments both in the vagina and the uterus. He rarely combined the treatment with X rays, nor did he approve of previous curettage.

Mr. Percival Cole (London), who followed, confined his remarks to the

General Position and Treatment of Inoperable Cancer of the Uterus.

He said that the numerical importance of the subject before them was emphasised by the inoperability rate which he estimated at 62 per cent. Operability, or otherwise, of any particular case was generally decided by the extent of local invasion, and it was estimated that in 60 per cent. of cases of cancer of the cervix death occurred as the results of effects determined by what remained to the last a local lesion. The regional glands were involved in from 24 to 38 per cent. of cases. Mr. Cole gave an account of the result of his experience at the Cancer Hospital, London, where 263 cases of cancer of the uterus were admitted between and including the years 1919-25. Of the cases admitted 103 were treated with radium and 61 by the Percy cautery operation; only 12 per cent. of cases were operable and 40 per cent. were too far advanced for any form of treatment. In discussing the technique employed in radium treatment he emphasised the importance of using

dosage and filtration suitable to the case. He had found that the use of needles and gauze packing had largely obviated the most important of the radium sequelæ—namely, proctitis, cystitis, and fistula formation. He did not approve of unfiltered glass capsules of radium emanation. He drew attention to the possibility of a violent hæmorrhage after the use of radium. This had occurred in five of his cases. He now ligatured the internal iliacs in the worst type of case. The speaker commented favourably on the systematic radiation of the pelvis by X rays after local radium applications, but had nothing favourable to say about the use of colloidal preparations. In referring to the Percy cautery operation he said that the average life duration of those who died had been 13.9 months after operation, which compared with 8.9 months in the radium cases after treatment and a total duration of life of 14.8 months in untreated inoperable cases. He had found that post-operative progress with relief of symptoms and absence of shock was a striking phenomenon following the Percy operation. He sometimes employed small doses of radium six to eight weeks afterwards.

Dr. M. Donaldson, in his paper on

Treatment of Inoperable Cancer of the Pelvic Organs, pointed out the necessity for educating the public on the early symptoms that might point to malignant disease in women. He did not believe this would increase the number of cases of "cancer phobias," but would tend to diminish it. He then described in detail the technique he employed for radium treatment of carcinoma of the cervix, the main principles of which were the use of 20 or more long needles of moderate intensity buried in and around the growth giving a continuous exposure for six days. The results of this technique were more promising than those of the method he had previously employed. He then drew attention to the necessity of investigating the biological laws involved in irradiating living tissues, and stated that interesting work by Dr. T. S. P. Strangeways and his other colleagues was being done on the effect of irradiation of tissue cultures, the results of which emphasised the importance of the distance and time factors. Finally, he pointed out the urgent necessity for organised and coördinated research, and hoped that the profession as a whole would urge the raising of public funds for this purpose.

Discussion.

Mr. Sidney Forsdike drew attention to the type of case where radium was contraindicated. He described the technique he employed and stated that he always removed any necrotic growth with a blunt curette as a preliminary to radium treatment.

Mr. G. I. Strachan (Cardiff) called attention to the risk of applying radium in cases of pyometra.

Circulatory Changes in Normal Pregnancies.

Dr. Dorothy C. Hare (London) read a paper comprising a preliminary report on an investigation of cardio-vascular conditions in normal pregnancy by means of clinical tests. The object of the investigation was to discover if by the methods of clinical examination evidence could be obtained of changes in the pulse-rates, blood-pressures, and response to exercise tests during the course of pregnancy and to relate such changes to the period of pregnancy in which they occurred. A series of observations on 40 pregnant women was made at four-weekly intervals, and the tests applied under uniform conditions; a number of other pregnant cases were examined once and their records included; 50 women medical students also were examined as controls. Other control figures were also obtained from the work of L. D. Cripps. As the report was a preliminary one the results were therefore incomplete. The mean of the figures obtained in each month of pregnancy was charted and the curves compared with the range of figures in the groups of control cases. The results, so far as they went, were remarkable for the high degree of "normality" and "efficiency" shown.

The mean pulse-rates lay within or below the control figures.

	Pregnants.	Controls.
Lying pulse-rate ..	83 to 85	None.
Sitting " ..	75 " 87	77.5 to 88.
Standing " ..	88 " 99	90 " 87.

It was only in the fourth month of pregnancy that the rate lay outside the range of the control figures, and there was no marked difference in the last months from the earlier months. A study of individual pulse records showed no general tendency to increase of rate in the later months. The difference between the lying or sitting pulse-rates and the standing rate was generally recognised as a test of the efficiency of the cardio-vascular mechanism in making rapid adjustments to change of position. An increase of 15 beats or less was usually considered a "normal" response. It was found that 88 per cent. of pregnant women gave a "normal" response and that only two abnormal responses occurred in the last two months. Comparison of the sitting and lying pulse-rates of the individual showed little difference on the whole, an increase or slowing of the rate with the change of position being met with in almost equal numbers. An exception to this was found in the eighth month of pregnancy, when the majority of patients have a slower sitting than lying rate. This was probably to be attributed to the position of the uterus in that month causing an embarrassment of the diaphragm and circulation when lying, which was relieved when the patient sat up, with a consequent slowing of the pulse-rate. The response to change of position in the ninth month was reversed. The exercise efficiency test used was an easy one. Patients stepped up and down on to a stool 7 in. high 30 times in 60 seconds. The pulse-rates after the exercise were recorded. A "normal response" might be taken as a return to or below the resting-rate in that time. A larger percentage of "normal responses" was found in the records of the later than in the earlier months. The blood pressures of the patients were recorded in the lying and sitting positions. They were taken by auscultation over the brachial artery, two observers working simultaneously on the two arms, two arm-bands being attached to the same mercury manometer. Several readings were taken in succession. It was found that the pressures, both systolic and diastolic, might be highly variable in the same individual at one sitting. The systolic and diastolic curves in pregnancy showed a mean rather below the control figures, and the actual range of systolic readings was low. The systolic pressures are not higher in the last month than in previous months, but the diastolic pressure showed a tendency to rise, though not above the control figures. The lying systolic pressures ranged from 116 to 109 mm. Hg. No control figures were available. A record of over 140 mm. was found only four times in 191 records. The presence of a persistent high systolic pressure in any case should lead to careful investigation to exclude the presence of any toxic condition.

FRIDAY, JULY 24TH.

The Rôle of Surgery in the Treatment of Backward Displacement of the Uterus.

Miss Frances Ivens (Liverpool) opened a discussion on this subject. She proposed to confine her remarks to the group of cases which she described as the immobile non-adherent backward displacement. In this group were included both retroversion and retroflexion of the uterus. She challenged the statement so often made that backward displacements in single unmarried women caused no symptoms, and if present they were due to a neurosis. She had found a definite pathological condition in a large number of such cases seeking treatment, and when the lesion was remedied the symptoms had disappeared. She entirely disagreed with the view which would treat not the displacement, but only its complications, and thought it was entirely wrong to conceal from the patient the fact that such a condition was present. The speaker had found it extremely difficult to prove the causal relationship of strain to this condition, but undoubtedly

retroversion was more common in women engaged in laborious occupations. In these cases it was possible that the malposition was already present, and the strain only exaggerated the condition. She regarded the dorsal decubitus during the puerperium as the most potent cause of backward displacements. In discussing the pathological changes associated with a retro-displacement, Miss Ivens said that these changes depended largely upon congestion and back-pressure due to interference with the venous circulation in the pelvis. Direct pressure upon the rectum by the fundus of the uterus sometimes produced hæmorrhoids. The speaker then dealt with the symptomatology of the condition and quoted illustrative cases of the results obtained by operative treatment. In her opinion there were only two classes of cases where the treatment of backward displacement was non-operative. These two classes were: (1) pregnancy and the puerperium; (2) grave organic disease. The operation she practised was Mayo's modification of the Gilliam operation, and she had performed it on more than 1000 occasions with only 5 deaths. She had been able to trace 200 post-war cases. Of these 58 per cent. were cured of all symptoms, 14.5 per cent. were improved, and 15.5 per cent. no permanent benefit.

Dr. Russell Andrews (London), who followed, agreed that operative treatment was best in the following types of cases: (1) Uterus fixed and retroverted; (2) dyspareunia; (3) childless women with repeated abortions. In the majority of other cases the retroversion could be ignored, and in this category came most, if not all, single women and girls. He refused to believe that a mobile retroverted uterus of normal size could press on the rectum and cause difficult defæcation and piles. The speaker commented on the fact of how practices differed and thought Miss Ivens saw a large number of school girls the ordinary gynaecologist did not see. He had, however, looked after the nurses at the London Hospital for the past 22 years, and during that time had only seen one case of retroversion. He thought that perhaps the preliminary dilatation and curettage had a beneficial effect on a large number of the cases. In referring to the modified Gilliam operation described by Miss Ivens, he stated that he had seen several cases followed by a small sensitive swelling on each side of the scar, which sometimes turned out to be a hernia. He had never made this lateral incision, but had always sutured the round ligaments to the edge of the aponeurosis on the other side, and had never had cause to regret it.

Mr. R. H. Paramore (Rugby) gave an interesting historical survey of the various procedures adopted for retroversion. He said that intra-abdominal pressure maintained the uterus in position and this depended largely on the muscular tone of the abdominal wall. He thought that surgical treatment was of secondary importance and advised the use of an abdominal support.

Prof. W. C. Swayne said that the rôle of surgery in retroversion depended upon the position of the appendages. If symptoms were present there was always some associated pathological lesion. He discussed the functions of the round ligaments, and emphasised the necessity of restoring the anatomical functions of these structures if an operation was performed.

Dr. Farquhar Murray (Newcastle-on-Tyne) warmly endorsed Dr. Russell Andrews's able criticism on the paper. He said that he could not too strongly deprecate the practice of giving nervous young girls minute details about their pelvic organs.

Prof. E. W. Marlow said that in his experience retroversion was fairly common in young girls and unmarried women, but in the majority of these cases there was comparatively little symptomatology. In cases where marked symptoms were present there was always some degree of descent of the uterus, and in these cases it was always necessary to repair the pelvic floor. He did not think that the operation described by Miss Ivens should be called after Mayo

for it was only one of the many modifications of Gilliam's operation. He did not agree about the general condemnation of pessaries, which, when fitted properly, were extremely useful.

Dr. Leith Murray said that he very rarely performed an abdominal section for this condition.

Colonel V. B. Green-Armytage (Calcutta) gave an account of his experience of gynaecological practice amongst the women in India. He believed that a large number of operations performed for retroversion were unnecessary. Miss Ivens briefly replied.

Erosion of the Cervix.

Dr. Gilbert I. Strachan then followed with a paper on the pathology and treatment of erosion of the cervix. This was, he said, the most common lesion in the female genital organs and was of special importance and gravity as a precursor of carcinoma. The pathology of the condition was discussed. The main predisposing factors were any breach of continuity in the cervix as occurred in a cervical laceration, or any alteration in the normal acid reaction in the vaginal secretion. Labour was then the usual antecedent condition, although in nulliparæ or virgins it might be congenital or due to lack of resistance to infection. Gonorrhœa might also be causal. The changes produced in erosion were traced and the possible complications mentioned, stress being laid on carcinoma. The best treatment was preventive, by giving plenty of time for cervical dilatation in the first stage of labour. Should laceration occur it should be sutured accurately if it can be seen. In treating the established condition the merits of application of antiseptics, electrical treatment, cauterisation, and vaccines were discussed, and it was concluded that it was only in slight and early cases that cure was likely to be effected. Most cases required operation, and while curettage would improve the endometritis that was often present, scraping with a sharp spoon was necessary for the hard cervix. The most effective form of treatment was found to be removal of the eroded area by the technique of Bonney. In some cases amputation of the cervix was called for, depending upon the amount of tissue to be removed, while in nulliparæ Schröder's operation was often satisfactory. While this line of treatment was radical it was the only way in which satisfactory and rapid cure could be attained, and was also an important preventive to the future development of carcinoma.

SECTION OF OPHTHALMOLOGY.

This Section met on two days, with Mr. W. M. Beaumont in the chair.

WEDNESDAY, JULY 22ND.

EYE INJURIES AND INTERSTITIAL KERATITIS.

Mr. Holmes Spicer, in opening a discussion on this subject, said that in a certain number of cases there appeared to be a connexion between interstitial keratitis and a local injury to the eye. In his experience such injuries had included a foreign body on the cornea, a "spark from the engine," chemical injury from caustic potash, surgical operation, and so forth. In 3 per cent. of the cases collected by him a direct association could be traced. In some cases the stigmata of hereditary syphilis might be absent and the question might become a most important one from the point of view of legal compensation. Harrison Butler had claimed that there was a connexion with injury in 20 per cent. of his cases, but the difference probably depended on the definition of injury. With regard to an injury being the cause of the attack, he asked how the occurrence of interstitial keratitis in the second eye was to be explained. In syphilitic patients operations such as needling and squint operations had not been followed by interstitial keratitis. On the other hand, in two cases, the condition followed very quickly on simple needling. If the organism is present in the eye there will be an attack some time or other, but the possibility of the organism lying latent for many years must not

be lost sight of. As to the possibility that the connexion with traumatism was a mere coincidence, he said that if this was the case we might expect to see cases where an injury to one eye was followed by interstitial keratitis in the other. Personally he had never seen such a case, though in the ordinary course of events the second eye was usually attacked subsequently to the injured one. He did not think the diagnosis presented any great difficulty. Typical interstitial keratitis was always syphilitic. Summing up the evidence, his opinion was that interstitial keratitis depended on the presence of the spirochaete inside the eye and its readiness for evolution. Whether or not an injury was capable of precipitating an attack depended entirely on the stage of evolution in which the spirochaete might happen to be.

Mr. N. Bishop Harman said that the important question from the legal point of view was this: Was it possible that whether, in default of any injury in any particular case, the attack of interstitial keratitis might possibly not have occurred. We must, he said, be on our guard, too, with regard to the psychological factor in all compensation cases.

Mr. Cyril Walker referred to pregnancy as a contributory factor. From the many severe and intractable cases he had seen at Bristol he recalled two especially. In one patient, a woman of 28, an attack began during a pregnancy. The second eye remained unaffected until two or three years later during another pregnancy, when that eye too succumbed. He had heard of a case following on an attack of conjunctivitis but had not himself seen one.

Mr. E. J. Primrose (Glasgow) said that in many cases of adult interstitial keratitis the Wassermann reaction might be negative. The diagnosis between syphilitic and tuberculous cases was not always easy. He advocated the arsenical treatment carried out by men who were prepared to use large doses and deal with any emergency that might arise.

Mr. Inglis Pollock laid stress on the urgency of antisyphilitic treatment. In two cases of interstitial keratitis following an injury to the cornea—both of them typically syphilitic—as the result of prompt arsenical treatment the second eye did not become affected.

Mr. A. W. Ormond recalled his experience during the war at a large hospital where many cases of traumatic corneal ulcer were treated. In as many as 10 per cent. of these cases an attack of interstitial keratitis supervened. The diagnosis between syphilitic and tuberculous keratitis was perfectly possible. Treatment was now far more important than it used to be 25 years ago. At that time mercury did not cure. It was different with modern arsenical treatment.

Mr. R. Wallace Henry spoke of a case of interstitial keratitis alleged to be the result of the administration of an anæsthetic.

Dr. de Schweinitz gave it as his opinion that an injury might lower resisting power, but in no other way could cause an attack of interstitial keratitis.

Mr. Bishop Harman read a paper on

Phlyctenular Conjunctivitis and Keratitis.

He said that in a total of 3300 children who had passed through the schools for the blind and the myope classes in London there were 699 whose disability was caused by inflammation of the superficies of the eyes. Of these 367 had suffered from ophthalmia neonatorum, 90 from purulent conjunctivitis of later years, and 242 from phlyctenular keratitis. Of these 242 cases 69 had such badly damaged eyes that they needed to be trained in schools for the blind. The proportion of total blindness in school-children caused by this disease was 3.56 per cent., while if we add to them the number of children with sight so damaged that they had to be educated in the myope classes, the percentage reached 7.3 of all included in the two types of school.

In discussing the ætiology, he said that it was a disease of the poorer classes, being rare in private practice. Comparing two classes of hospital patients,

native and Jewish, it was found that phlyctenules were three times as common among natives as among Jews. The only factor accounting for these two contrasts is the food factor. Children of the middle class were well fed, and so were the children of alien Jews on a diet into which oil largely entered. Both these classes escape the ravages of phlyctenular disease. With regard to age incidence, he said that the frequency increased from the second year of life to the fifth, declining in later years. The state of the mouth in poor children of about 5 was apt to be worse than either earlier or later. The initial lesion was more commonly found in the lower and outer section of the limbus. More than half of the cases observed began in this situation or on the cornea adjacent to it. The nerve-supply of this area was derived from the loop formed by a twig from the lacrymal nerve and from the second division of the fifth, so that irritation within the mouth would explain the occurrence and situation of the eruption. The link of connexion with the lacrymal nerve similarly accounted for the profuse lacrymation that occurred. Unbroken phlyctenules were sterile so that it cannot be contended that the disease is due to microbic infection. Unlike contagious forms of conjunctivitis, phlyctenular disease was not specially rife during the spring and summer months, but is fairly evenly distributed throughout the year. The typical phlyctenule had a fluid content. The early investigators who considered it to be of the nature of a blister were right. These points of evidence converged on the general conclusion that the disease was a manifestation of some general disability and not a specific infection of the tissues of the eye.

With regard to the connexion with tuberculosis, the evidence for this, he said, was very slight. Of the 242 cases of phlyctenular disease already referred to, only eight had tuberculous lesions. Of 81 cases seen more recently only one showed any infection with tubercle. The evidence went to show that the primary general condition is not tuberculous, but feebleness due to lack of proper food and perhaps also lack of sun and air.

The prevention of this disease was bound up with the general social betterment of the people. Among factors making for this were the school medical service, by means of which cases requiring general or local treatment were discovered; open-air schools, dental and throat treatment, and the transfer of serious cases to country hospital schools through such an arrangement as there was in London between the County Council and the Metropolitan Asylums Board. Though these measures involved an immediate expense, when the saving in effective citizenship was considered they could not fail to be an ultimate economy.

A Light Recorder.

Mr. Wallace Henry demonstrated an instrument for recording light minimum and light difference. It was a somewhat elaborate piece of mechanism, but by its means he had made this interesting observation in regard to light adaptation. There might be a difference in the two eyes of as much as 50 per cent. in the time taken for light adaptation, even in cases with normal light difference and normal light minimum.

Mr. A. S. Percival referred to his own simple clinical device of revolving discs for testing light minimum and light difference. As an instance of its practical utility he recalled the demonstration of a defective light minimum in a case of cataract in which he had discouraged operation on the ground that there was a probability of a macular affection. On the patient's subsequent appearance after an operation properly performed elsewhere but resulting in no benefit to the sight, Mr. Percival found his diagnosis confirmed.

Mr. R. Colley showed a case in which, as the result of an accident to a medical man, a piece of glass 7 mm. long could be demonstrated lying behind the lens and apparently doing no harm, the vision remaining at 6/5. Several more or less similar cases had been recorded.

THURSDAY, JULY 23RD.

On the second day Mr. Freeland Fergus opened a discussion on

Ocular Pain.

Two main causes, he said, were: (1) Uncorrected refraction, defects of accommodation, and muscle balance; (2) septic infection. In the first category he placed cases when there is difficulty in retaining parallelism on distant vision owing to a defective power of the external recti. In the latter he included pain following operations due to defective technique. Corneal ulcers were best treated not by atropine and bandaging, but by pilocarpine, frequent douches, and dark glasses.

Mr. Wallace Henry referred to reflex pain from decayed teeth. He remembered a case in which severe pain in the eyes was caused by defaecation. As a douche in operation cases he used 1:4000 acriflavine.

Mr. Bishop Harman referred to heat as our most valuable remedy in dealing with ocular pain.

Mr. A. S. Percival referred to the use of dionine.

Dr. Webster Fox pinned his faith to leeches, belladonna, and poppyhead fomentations and salicylates. He spoke favourably of milk injections (3 c.cm. to favour leukocytosis) and daturin instead of atropine.

Mr. Lindsay Rea read a paper on the

Treatment of Ocular Syphilis.

This paper, he said, was a plea for the prompt and energetic treatment of cases whether acquired or congenital. As an example of the former he displayed on the screen photographs of a young man who developed an alarming proptosis while on his honeymoon. The proptosis increased from day to day. It was directly forwards and there was limitation of movements in all directions, diplopia and pain. The pupil reacted to light, but vision was reduced to 5/60, and subsequently the eye became temporarily blind. There was very marked conjunctival oedema. At first one eye only was affected, but in the course of two or three weeks the second eye also became proptosed. Vision rapidly deteriorated in both and the eye first affected became blind. Meantime the Wassermann reaction was found to be strongly positive, and thereupon the patient was put on injections of novarsenobillon, 0.45 g. every fifth day for eight weeks. After two or three injections the proptosis began to diminish and the vision began to improve. Iodide of potash in 25 gr. doses was also given thrice daily and mercurial inunctions. At the end of three months the vision was 6/6 in each eye and the proptosis had entirely disappeared. It was a case of gummatous infiltration of both orbits rapidly responding to treatment.

Turning to congenital cases, Mr. Rea discussed first the diagnosis and then the treatment of interstitial keratitis. In 72 of his cases the Wassermann test was done. Of these cases 64 were new ones, and in every one of them the Wassermann reaction was positive. In eight old cases it was negative, but in five of them where he was able to get an examination of the cerebro-spinal fluid, although the Wassermann was negative, a luetic curve was obtained by Lange's colloid gold test.¹ He had not found a single case of typical interstitial keratitis which was not syphilitic.

In the case of adults he used N.A.B. injections, beginning with 0.3 g. and rising to 0.45 g., or in some cases to 0.6 g. In the case of children under 10 he used just half these doses and withheld mercury during the period of injections. Ten or 12 weekly injections were given, and under this treatment the results obtained were far better than under the old treatment with mercury and iodide of potash. Moreover, in 63 consecutive cases of interstitial keratitis treated with arsenical injections not a single case of deafness had developed. With regard to the duration of treatment with arsenical injections, it varied from four and a half to eight months. In cases where the veins of a child were difficult to find,

Mr. Rea recommended the intramuscular injection of sulpharsenol into the buttock—6 cg. weekly.

The value of Lange's colloid gold reaction in establishing the diagnosis of syphilis was shown by a case of retino-choroiditis with negative Wassermann, both of the blood serum and cerebro-spinal fluid. The colloid gold test showed the luetic curve. Treatment with mercury and iodides arrested the disease and vision in one eye rose from 6/24 to 6/6. An interesting observation, in which Dr. Rayner Batten concurred, was that affections confined to the macula were not due to syphilis, although the macula might become affected in generalised syphilitic affections of the retina. In cases of congenital syphilis the Wassermann reaction was misleading. In old cases it may become negative without treatment, whereas in recent cases, in spite of efficient treatment, it might remain positive. If cases of ocular syphilis were treated vigorously with such preparations as novarsenobillon the results, although not dramatic in suddenness, were consistently good.

Mr. A. W. Ormond read a paper on

Visual Hallucinations of the Sane.

In some cases of hemianopia visual hallucinations appeared only in the half field. They depended on visual memories and the faculty of visual memory differed enormously in different people.

Mr. Wallace Henry recalled a case of distressing visual hallucinations in a patient with both eyes excised which was cured by 1 per cent. cocaine applied to the stump of the nerve in the socket.

Mr. J. Burdon-Cooper read a paper on the

Conservative Treatment of Glaucoma.

Some underlying causes of glaucoma were depression and worry, high blood pressure, errors of metabolism, intestinal troubles, and acidosis. To combat congestive attacks he advocated warm baths, the hypodermic injection of $\frac{1}{4}$ g. of morphia twice daily, and the administration of nitro-glycerine, $\mathcal{M}$ i. every four hours, dry heat, scarification of the temple, and pressure massage, which last measure might reduce the tension. These measures were intended not as a substitute for, but as a supplement to operative treatment.

New Inventions.

OPERATING BOOTS.

THE operating boots here illustrated are the outcome of an attempt to obtain a legging which could be worn if desired over outdoor shoes, stand repeated sterilisation by dry or moist heat, be easily kept in place, and wrap up into small compass. The sole of the boot is made of special rubber, which is unaffected by boiling or steam, and the upper is of white coutil, which washes well, and is attached to the sole by hand-sewing, without the use of any rubber solution. The single long tape in front allows the boot to be attached to a front brace button, and the ankle tapes tied over the instep keep the foot portion in place. I have had one pair in constant use at hospital for the last nine months, and they show, as yet, no signs of wear.

I am much indebted to Messrs. Allen and Hanburys, Wigmore-street, W. 1—from whom the boots can now be obtained—for the trouble they have taken in finding the right materials to meet the objects I had in view.

ERIC PEARCE GOULD, M.Ch. Oxf., F.R.C.S. Eng.



¹ THE LANCET, 1920, ii., p. 688.

Reviews and Notices of Books.

OFFICIAL HISTORY OF THE CANADIAN FORCES IN THE GREAT WAR, 1914-19.

The Medical Services. By Sir ANDREW MACPHAIL, Professor of the History of Medicine, McGill University. Published by authority of the Minister of National Defence. Ottawa: F. A. Acland. 1925. Pp. 428.

A CURIOUS and interesting book; an official history of the medical services of Canada in the war, yet prefaced by an official notice that "the opinions expressed are those of the author himself." The author confides to us some of the difficulties of the Canadian Medical Corps, sometimes caused by "the Imperials," but in the first half of the war the greatest difficulty of all was, he tells us, the Minister of Militia. And no doubt the Minister, like others, was far from perfect; he considered himself a universal expert, misunderstood and misjudged the work of the Medical Corps, naturally embroiled himself with his professional advisers, fought then for himself rather than for the service, and had to resign. Yet it should not be forgotten that "Sam," as he was known all across Canada, had seen the menace of Germany far sooner than most people, had prepared against it with ability, and, in Parliament at Ottawa in 1910, had given publicly to Lord Roberts the credit for foresight which so many smaller people were denying him. He also worked hard to send quickly overseas the 30,000 Canadians of the first contingent.

To the surprise of the War Office "the equipment brought with them was largely worthless and had to be replaced" (p. 29) from British ordnance and medical stores, and their training was still to come; so, though soldiers were badly wanted in France that winter, this division could not be sent across until February, 1915. The author is of opinion they might have been made more quickly battle-worthy in Canada, but in England they were closer to the real school of war, France, and were besides, through that depressing winter, a convincing evidence of the solidarity of the Empire. Once the division did get to France the credit of the Canadian troops was quickly established and soon grew to a great renown, not earned without sacrifice. Of 418,052 Canadians overseas, 51,678 (123 per 1000) were killed or died of wounds, 4960 (12 per 1000) died of disease; a heavy toll of her best which Canada still mourns. The chapters describing personal experiences of various medical officers and units are delightful reading. With his experience of the early confusion and the later orderliness of the war, why did the author not provide an appendix telling the newly volunteered medical officer on what duties to concentrate in the first days of a general mobilisation when all is strange and new, and conservancy and infectious diseases require particular care?

Medical units were, very properly, the earliest to reach the great first Canadian camp, Valcartier, and the subsequent development of the Canadian Medical Corps is carefully recounted and the diseases of the war are discussed. Venereal diseases were a great trouble though not, strictly, diseases of the army, being always contracted from civilians, outside the army. "Idleness is the mother of lechery" is the author's aphorism, from which we may deduce that the best disciplined troops should show a smaller venereal rate. The author agrees with the Official Medical History of the War that it is not yet known whether preventive measures and/or early treatment have really prevented infections from developing, but he reports the experience of the Canadian Corps with some hopefulness. Any man if infected had to disclose where the infection was contracted, and the woman was deported from the area, and, so long as there was no leave, one case only appeared per day among 30,000 men, the usual rate being three or four times as much.

The work must be read as a whole, as its parts are not everywhere consistent. Thus, on p. 306, we are told that "the food at all times was abundant and unailing," though on p. 296 the food of No. 3 Stationary Hospital at Mudros was stated to have been "scarce and unsuitable for the personnel, impossible for the patients." Marvellous things happen in war, but who would have believed that horse lines, "the best in the army," so Field Marshal Plumer described them (p. 54), were designed by the Mother Superior of a Belgian convent!

CLINICAL THERAPEUTICS.

In two volumes. By ALFRED MARTINET, Paris. Authorised English translation from the second revised and enlarged edition, by LOUIS T. DE M. SAJOUS, Philadelphia. Philadelphia: F. A. Davis Company; London: Stanley Phillips, 45, Brondesbury-road, N.W. 6. 1925. Pp. 718. Price for the two volumes, 67s.

THE author in his preface styles his book "a manual of practical medicine, based on an essentially novel plan conforming to the actualities of practice and meeting clinical requirements." He points out that it is a complement to an earlier work entitled "Clinical Diagnosis." It is a bold claim that any book on medical treatment can be essentially novel, but that it conforms to the actualities of practice we are willing to admit. It is wide in its scope and excellent in its material. A medical student cannot possibly, in his short time in the wards, see all the processes used in the treatment of patients. But according to luck, and to a persistence in being present at times apart from the rounds of his chief, he may see many things he would only learn as a resident or not at all.

This book, besides giving many useful helps in drugs, tells in detail how the student must do those things which he has heard of and not seen, or has only seen done by someone else. The first part, the therapeutic agents, is divided into medicinal, alimentary, physical, and psychic agents; medicinal agents are again divided into (1) drugs acting on a definite function, and (2) those acting selectively on infectious and parasitic disorders. This last part, including serum therapy and chemotherapy, forms a section which is especially useful. Drugs acting on organic function are subdivided according to the system of the body in which they act principally and the best known one of each class is taken as a type. Pharmacology and chemical structure is touched on sufficiently to give the *raison d'être* of many of the drugs.

In the second volume, dealing with symptomatology and treatment, Dr. Martinet lays great stress on the importance of avoiding "equation therapeutics," but gives a very comprehensive 200 pages of common symptoms arranged in alphabetical order, with remarks on the various conditions they may indicate and the appropriate treatment. His fourth section, the treatment of disease, he divides into diseases of the various systems, metabolic, infectious and venereal diseases, skin, ear and eye diseases, and treats their subdivisions in systematic detail. He has made more use of his collaborators here, and whole sections are written by specialists in their particular diseases. The author's article on the treatment of poisoning is very well arranged and employs the tabulated method for quick reference, and his final chapter on instructions to the patient contains a great deal of matter that few general practitioners could read without a certain feeling of shortcoming. He insists that full dietary, hygienic, and physiotherapeutic instructions should be given not only verbally but also "legibly written on good paper"—an excellent rule, if perhaps, a counsel of perfection.

Generally, the book is a direct translation from the French. The section on watering places has been liberally adjusted to the American reader, and the writer (or translator) is somewhat unfortunate in selecting Epsom as a place in England known for

its purgative mineral waters. The book abounds in long words not in common use in English medicine, of which hypocritic, crenotherapy, crymotherapy, inoscopy may be taken as samples, and in many respects it is tuned up to the American rather than the English reader. It is a valuable compilation.

THE HEALTH OF CHILDREN.

Health in Childhood. Five Lectures delivered at the Institute of Hygiene. With a Foreword by A. MIDDLETON HEWART, M.D., D.P.H. London: G. Bell and Sons, Ltd. 1925. Pp. 94. 2s. 6d.

Healthy Childhood between Infancy and School Age. By MARY E. WESTON, M.B., B.S. Lond., Assistant School Medical Officer and Assistant Infant Welfare Medical Officer, County of Leicester. London: Faber and Gwyer, Ltd. (The Scientific Press). 1925. Pp. 135. 4s.

It is a mistake not uncommonly made to assume that one has only to write down the elements of hygiene for children in simple language and any mother will then be able to read, understand, and put these rules into practice. The subject has to be approached and explained in almost as many different ways as there are mothers, so that books on child welfare with an original outlook are still welcome. The first of these two volumes consists of five lectures on somewhat less popular and certainly less known aspects of the subject. Lieut.-Colonel Robert H. Elliot writes with all his well-known authority on the care of the eyes in children; Mr. George Thomson on the care of the primary teeth; Dr. King Brown on the prevention of infectious disease in childhood; the late Mr. Græme Anderson on the prevention of deformities in children; and Dr. C. S. Thomson on the mental and moral education of the child. All these papers, which were lectures delivered this year at the Institute of Hygiene, are of a high standard of excellence and demand the careful attention of all those dealing with the care of the young.

Dr. Mary Weston is concerned with the health of the toddler or pre-school child, a subject about which not much has been written in this country, although, and despite what Dr. Feldman says in his foreword, there have been several excellent volumes published in America. After a brief introduction the author deals successively with the diet, clothing, sleep, physical development, the air and sunshine requirements, the training and the holidays of the child between the period of infancy and school age. Two chapters are added on the child in sickness and on some common diseases. Well written, with much common sense, this book should have a wide appeal.

TOXIC GOITRE.

Kliniske Studier over Thyreototoxicosenes Diagnose og Prognose. By Dr. JOHAN HOLST. Oslo: Jacob Dybwad. 1924. Pp. 96.

WITH the financial assistance of the Fridtjof Nansen Fund, Dr. Holst has published a monograph which embodies his study of 150 cases of Graves's disease or Basedow's disease—terms which he prefers to discard in favour of the more modern expressions thyreotoxicosis or toxic goitre. He attaches a certain value to the Goetsch adrenalin test, Kocher's cytological formula, the blood-corpuscle suspension test, the sugar-tolerance test, and de Quervain's rat test, but it is the basal metabolic rate, as determined by Krogh's method and apparatus, on which he relies most for a diagnosis. He does not, however, undervalue the clinical examination. The term "latent thyreotoxicosis" is used by the author in connexion with those cases in which the metabolic rate is increased, although there are no clinical signs of the disease. It is probable that the patient who suddenly develops Graves's disease after a fright has been for some time suffering from latent thyreotoxi-

cosis. For it is difficult to explain how the organic changes of Graves's disease could develop suddenly as a sequel to psychic shock. As the author points out, a knowledge of latent thyreotoxicosis is of great importance to the early diagnosis and treatment of the case.

Dr. Holst gives an interesting account of cases of monosymptomatic thyreotoxicosis, the patient suffering from neurasthenic symptoms only, or only eye symptoms or diarrhoea. Or the only symptoms may be referred to the heart. It is in such cases that the clinical diagnosis is apt to be wrong, and the determination of the basal metabolic rate is of unusually great importance. It is also very helpful in distinguishing between neuroses and thyreotoxicosis, for if the metabolic rate is found to be normal the patient is certainly not suffering from hyper-function of the thyroid gland. But if there is an increase of the metabolic rate by 25 to 30 per cent., thyreotoxicosis probably exists, although in neuroses also there may sometimes be a slight rise of the metabolic rate. With regard to operative treatment, the author is in favour of early radical resections in order that the proliferation of the toxic cells may be arrested before irreparable damage has been done to the heart or other organs. When symptoms persist after an operation, a determination of the metabolic rate will show whether they are due to an insufficient removal of diseased thyroid tissue or to secondary lesions in other organs, and thus the metabolic rate helps the surgeon to decide for or against another operation. It is again the metabolic rate by which the surgeon should be guided in the worst cases, and when this rate is more than plus 70 per cent. the author considers surgical treatment as dangerous.

The chief message, then, of Dr. Holst's admirable monograph is the value of the metabolic rate to the study of almost every aspect of Graves's disease.

PRACTICAL PATHOLOGY.

Including Morbid Anatomy and Post-mortem Technique. Second edition. By JAMES MILLER, M.D., D.Sc., Professor of Pathology, Queen's University, Kingston, Canada. London: A. and C. Black. 1925. With 109 figures. Pp. 528. 15s.

WE do not wonder that a second edition of this book, first published in 1913, has been called for. It does what it sets out to do very well, and gives a plain, easy, straightforward account of what the elementary student of pathology wants to know about his work in the post-mortem room. Eminently practical directions for making autopsies are interspersed with brief descriptions of morbid appearances and their meaning, and at the end a section is devoted to the methods of preserving and examining tissues. Prof. Miller gives one good way of doing each thing, which is educationally a far sounder plan than providing a maze of alternatives. It is certainly better to be able to cut up a body and display the organs neatly according to some definite and familiar plan and to be able to stain a section really well with hæmatoxylin and eosin than to half know three ways of performing a necropsy and ten ways of staining a section. There are, of course, plenty of small points in which each working pathologist who reads the book will be sure that the method recommended is not really the best—it is cosmetically preferable to open the neck by two incisions from the mastoid processes meeting at the top of the sternum than by a single median cut (Fig. 4); it is more elegant in v. Kossa's method (p. 434) to develop the silver phosphate with pyro than to rely on sunlight; rubber gloves are handier in use if one wears a pair of thin cotton gloves over them (p. 5); there is more to say about the aetiology of rickets than is found on p. 326—but there will be plenty of time for the student to learn some of these variants when he has really mastered some one way of doing what is requisite and necessary.

INDUSTRIAL POISONS IN THE UNITED STATES.

By ALICE HAMILTON, M.D. New York: Macmillan Company. 1925. Pp. 590. 21s.

THE writer of this volume is an international authority who has made the matters discussed her own speciality and has visited many countries in the course of her studies. In some ways the title chosen is somewhat misleading, since, although the objective is industrial poisons in America, the information amassed is drawn to no small extent from investigations made in Europe and particularly in Great Britain. The scope of the book is strictly limited to recognised industrial poisons, such as lead, mercury, arsenic, caustics, acids, vapours and gases, and benzene compounds; but what determined the inclusion of troubles from oil and tar cancer, while the toxic silica is omitted, is difficult to guess. Further, there is no reference to caisson disease, which is well known in the United States, and might usefully have been grouped with gassing. If limitation of space was the determining factor, condensation might have been exerted relative to lead poisoning, which receives the lion's share of space; indeed, it accounts for nearly half the volume. Lead poisoning has in the past truly led the way in industrial toxicology, but its causation is now so well understood and its frequency is so rapidly diminishing, that the time has come to place it in more correct perspective. Nevertheless, the exposition given is likely to become for some time the standard for reference.

The scheme adopted is to state for each poison first a description of its symptoms and pathology, and then of the risks as they occur in industry. Long technical explanations of processes—all too common in books on this subject—are commendably avoided; and chemical questions are only introduced when required to display a connexion between molecular structure and toxicity. Prevention of risk is only incidentally discussed in connexion with causation, while treatment is entirely omitted. This omission, particularly in regard to such things as gassing with carbon monoxide, seems unfortunate.

On the whole, the book is readable and well written. It places at the disposal of those interested a wealth of information in ordered sequence.

ELECTRICAL CONDUCTIVITY OF THE HUMAN BODY.

La Conductibilité Électrique du Corps Humain.
By ANDRÉ STROHL, Docteur-ès-sciences, Professeur à la Faculté de Médecine d'Alger. Paris: Masson et Cie. 1925. Pp. 128. Fr.8.

Dr. Strohl has conducted original research on the electrical conductivity of the human body. By means of a ballistic galvanometer he has been able to determine the resistance of the tissues at the moment when the current commences to flow and for minute fractions of a second after. With the apparatus at their disposal, previous workers have not determined the resistance at such early periods of the flow of the current. When a current at constant voltage is used, Dr. Strohl has shown that the resistance of the body rises, during the first few thousandths of a second, to a value two to five times greater than that found when the current has passed for longer periods. After this initial increase it falls, at first quickly, and then more slowly, till it reaches the values obtained by earlier workers. The author regards this initial rise, the existence of which has not hitherto been known, as the result of an E.M.F. acting in a direction opposite to that of the measuring current and produced by polarisation. This polarisation increases at the moment when the current commences but then diminishes slowly. It takes place throughout the tissues traversed by the current, but mainly in the skin. It is determined by the varying permeability of the cell membranes to the tissue-ions and it disappears, in part at any rate, when the integrity of the membranes is lost. The author thinks that the degree

of permeability depends upon the nervous system, probably the sympathetic.

Dr. Strohl's work is of high scientific value. It shows that the polarisation of the tissues, causing as it does considerable variations in the strength of the current produced by a constant E.M.F., constitutes a source of difficulty in the measurement of tissue excitability to currents of short duration, and a possibility of error in the determination of the chronaxie. The author thinks that further study of the opposing E.M.F. caused by the polarisation, and the initial resistance of the tissues would yield information of value in the study of certain functions of the tissues.

ALCOHOL IN MEDICAL PRACTICE.

By COURTENAY C. WEEKS, M.R.C.S., L.R.C.P.
London: H. K. Lewis and Co., Ltd. 1925.
Pp. 186. 3s. 6d.

THE object of this little book is to show that although there has been a remarkable decrease in the use of wines and spirits in various hospitals and institutions within recent years, there is still room for even further decrease, if the use of alcohol as a drug be removed from the realm of empiricism and treated scientifically on its pharmacological merits. Dr. Weeks claims that his conclusions have been reached by a "careful consideration and appropriation of much that has been written during the past thirty years." These conclusions would carry more conviction to his professional brethren if some of the rhetorical utterances, which the author no doubt has found useful in public lectures, were curtailed, for they obscure a scientific analysis of the subject. Nevertheless, many of the arguments are very sound, and the tabulated results of an inquiry into the comparative amounts of alcohol used in various hospitals and other institutions in the years 1900 and 1923 are very instructive. One point, and not an unimportant one, which Dr. Weeks ignores, is the undoubted psychological effect of alcohol taken in even small doses by patients in the belief, erroneous or otherwise, that it is doing them good. A chapter on the evolution of medical opinion has been added and is very interesting reading. Dr. Weeks writes well and in a convincing manner, and perhaps this volume will be of some assistance in enabling those of "our professional brethren who have been so fast bound in the shackles of the past to emancipate themselves and their patients into the greater freedom of a newer knowledge." But this is one of the passages which the book would be better without.

ANATOMISCHE PRAEPARIERUEBUNGEN.

By HANS VIRCHOW. Curs I. and II. Berlin and Leipzig: Walter de Gruyter and Co. 1924.
Pp. 66 and 110. M.5.50.

THIS is a guide for anatomical students, telling them shortly what they are expected to display, but not saying much on the subject of carrying out the intention. The first "Curs" is concerned with the muscles only, and the arm takes seven pages in this connexion. The fullness, comparatively, of the sections on the post-vertebral muscles seems to us rather remarkable, for one would imagine it more profitable to expend effort so relatively great on more worthy subjects; moreover, these muscles are among the easiest to teach in the body. Similar remarks might be made on the treatment of the face. These little books are not for teaching anatomy but for guiding the learner, but even from this point of view they are the curtest with which we are acquainted, though little human touches appear here and there among the short directions which may give pleasure to a worried reader. There are simple diagrams to show incisions and broad margins and spare pages for notes. The printing and appearance of the book are excellent.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 5, 1925.

AN IDEALIST ON MODERN SCIENCE.

THE British Association for the Advancement of Science held its annual meeting at Southampton last week, and on August 26th Prof. HORACE LAMB, F.R.S., delivered his presidential address. As a mathematician, he confessed that he found it difficult to choose a subject in which he had himself been interested without overstraining the patience of his audience, but he was equal to the test. He spoke on geophysics, a subject of intense interest to everyone of whatever education, and confined himself to facts of the earth's constitution that have been gathered from observations made in our own time, and mainly those that bear a mathematical or physical significance. Before he came to the subject-matter of his address, however, he reminded the Association of some general truths concerning science that cannot be repeated too often. He said that to the question "What is the real purpose of science, and what is the common inspiration of scientific effort and the common ambition of scientific workers?" there is a kind of stereotyped official answer, given in a formula that has become almost consecrated—viz., "To subdue the forces of Nature to the service of man." In other words, the only real value of science is as a key to the material gains and the larger powers that have in the last two centuries so transformed the external part of our lives, and since there is no knowing what abstract research may not prove in the future to promote the supreme end, the more speculative branches of science are to be not only tolerated, but to a certain extent encouraged. Now this Prof. LAMB rightly held to be only a part of the truth. Practical utility has undoubtedly been the conscious aim of much scientific work, and sometimes perhaps its main justification, but the Association would not admit that this formula adequately described what had really inspired discovery through the ages. The conic sections of Apollonius were to him not a possible future guide to the motions of planets, but a study that was legitimate and respectable in itself; and FARADAY and MAXWELL, feeling their way towards an electric theory of light, had no prescience of wireless telegraphy, though this was a development of their researches by no means remote.

For the British Association the primary aim of science must be to explore the facts of Nature, to ascertain their mutual relations and to arrange them as far as possible into a consistent and intelligible scheme. This is the true inspiration of scientific work, as success in it is the appropriate reward. The material effects come later if at all, and often by a very indirect path. In this constructive task, the President saw a very distinct æsthetic motive, and he showed in a fascinating piece of argument that the research worker was really as much an artist as the musician or the sculptor. A well-ordered piece of algebraic analysis is very like a musical composition. To the uninitiated it is merely a mass of curious symbols, but so is the score of a symphony, and in both is shown that purposeful evolution of a mass of unrelated elements into a

grand harmonious unity, that marks the working of the universal creative life. Enthusiasts are using a perfectly true analogy when they speak of the poetical charm of LAGRANGE's work or the classic perfection of MAXWELL's expositions, and the interest men find in the latest achievements of physical science should be not so much due to the hope of future profit as to the intrinsic beauty and novelty of the visions unfolded. Nevertheless, it would be disloyal to science, said Prof. LAMB, to depreciate the material advantages that it has bestowed on civilisation. The most utilitarian result is based on long and patient study and experiment, and science is also greatly indebted to industry for the impulse it receives from new problems and the extended scope that industry opens for its experiments. The National Physical Laboratory, started mainly in the interests of industry, is now, as Prof. LAMB pointed out, a great institute of theoretical as well as applied science, informed throughout by the true spirit of research. In speaking of HUXLEY in connexion with the increased intellectual freedom of to-day, the orator defended science against the criticism that arose from the disappointment of those expecting it to reform human nature, a criticism that President WILSON has expressed forcibly by the words, "Science has won us great liberty in the physical world but has not freed us from ourselves." It is not in the province of science to improve human nature. Science can give the gifts, but cannot bear the responsibility for their use by the human race. It can take its rightful place in our sports, as Prof. A. V. HILL shows well in his address to the Physiological Section of the Association (see p. 481), but it cannot prevent the abuses of too much play. Medical science has given us longer and healthier lives, but is not responsible for the use we make of them. It benefits both the just and the unjust, but we would not on that account close our hospitals or condemn our doctors.

Prof. LAMB then set forth some very interesting facts about geodesy, and the results of the latest researches on the shape and constitution of the earth, its rigidity and elasticity, and the forces that act upon it, and closed on a note of tribute to the great part that local universities and university colleges have played during the last 50 years in developing science in this country and the empire. He referred to the new schemes by which the University College of Southampton were now increasing their activity and furthering their development, and wished them every prosperity in the name of the British Association. Science has never been so widely and so enthusiastically cultivated as at the present time, with so complete sincerity, with more brilliant success or even with less of international jealousy: Prof. LAMB's words to this effect can fairly be re-echoed by those who pursue medicine.

THE INDIAN MEDICAL SERVICE.

LAST week, in the Students' Number, we essayed to place before the medical schools a picture of the Indian Medical Service which would enable those who were choosing a career, and their advisers, to judge what the opportunities really are in the Service—both what are the drawbacks which have ensued on the great political changes of recent times, and what are the advantages which may be secured to the members of the Service under the various schemes put forward to deal with an admittedly difficult situation. How difficult was well elicited recently in the House of Lords when Lord SYDENHAM asked the Secretary of

State for India "whether measures are in contemplation adequately to fulfil the medical requirements of the Indian Army, British residents, official and non-official, and the civil hospitals, and to secure the progress of modern science in all its branches throughout India." In support of his inquiry Lord SYDENHAM reviewed briefly but eloquently the magnificent work that has been done for many years by the Indian Medical Service; he did not say a word too much when he claimed for it the position in the past of the finest public medical service ever created. The justification of this praise is to be found not only in the standard of health which has always been maintained in the Indian Army to which the Service specially ministers, but in its achievements on the civil side whereby a hospital system has been spread over the Indian Empire, and a directive force produced for the support of all that may be called sanitation in the country. When statements like these can be made unchallenged—and identical sentiments have been appearing in our columns for the last three-quarters of a century—no one can look upon a complete revolution of such activities with anything but sincere regret. But the idleness of tears is well replaced by constructive energy for the future. India definitely requires European medical assistance, not only for the care of the military and civil European populations, but for the maintenance in the country of that spirit of modern medicine which has accomplished already such mighty things, and which day by day is spreading in influence and value. It is a national responsibility to meet the requirements.

We need not recapitulate here the recommendations, now some eight years old, of the Royal Commission on the Public Services, nor those of the Verney Lovett report, for they have all been thoroughly discussed. The practical point is how far the last concessions under the recommendations of the Lee Commission will offer attractive terms for young medical officers and will at the same time provide in India for the three things which are seen to be essential—namely, the maintenance in India of modern standards of medicine, the conservation of the health of the military and civil Europeans, and the due care of their families resident in India. The answer to this far-ranging question was to some extent supplied by the Secretary of State for India in his reply in the House of Lords to Lord SYDENHAM's request for information. The Lee Commission, Lord BIRKENHEAD explained, had taken the same line with the Indian Medical Service as with the other All-India services in dealing with what are termed the "transferred subjects." By the Commission it was proposed that the R.A.M.C. should absorb the I.M.S., but the conclusion has since been reached that the I.M.S. ought to remain as a military service, its reserve being secured from the officers lent to the civil administration. The recommendations further proposed that the Provincial Governments in India should in the future recruit and control the services for whose work they were responsible to their legislatures; but here the Secretary of State pointed out that in the case of the Indian Medical Service the general principle is limited by the considerations that the needs of the Army would have to be met by drafts from the Civil Medical Service—a service 50 per cent. Indian recruited—while special arrangements would be made to obtain medical attendance for European residents by British medical men. But efficiency in such attendance may be difficult to secure, and there does not seem any stronger appeal inherent in the work than we have been able to put forward last week. Good men will make their presence felt and appreciated, but unless

the districts are limited there is much chance of wasted effort. Lord BIRKENHEAD inclined to the belief that it will be essential to earmark for the portion of the Army Reserve lent to the civil side, but not required directly for the medical care of the British Services, a number of civil positions, and he instanced research or professorial appointments. These appointments have always been attractive to officers of the Service, and, said Lord BIRKENHEAD, "if the essential Army Reserve maintained in civil employment allows a margin (as it almost certainly will) it is clearly a gain not only from the point of view of recruiting inducements, but to Indian public health generally that the men should be employed in the departments of research and teaching in which their predecessors have done so much for the welfare of India."

At any rate the period of inactive regret seems to have passed, and a general conclusion reached that there is a fine future before the Indian Medical Service, even though vast alterations in the world, mainly of modern origin, have brought with them a revolution in the conditions of work. Those who enter the Service now, no less than the pioneers of medicine in India a century and more ago, will have before them a great constructive task. Their predecessors tilled virgin soil. The present soil, though much remains untouched, has in the great essentials been cultivated and cultivated successfully, but under methods which in detail will no longer be pursued. Success will none the less come to the Service while its great ideal remains of promoting in India, for Europeans and Indians alike, the principles of health and sanitation. Medical science should know no difference between races, but it cannot, out of unbounded tolerance, be called upon to countenance mysticisms and superstitions. The work of the vaid and hakims, and the antique theories of indigenous medicine will give place in time to scientific procedures founded upon anatomy and physiology, upon observation, experiment, and research. Much tact will be required to persuade many millions of uneducated persons to look to science for their salvation, and the early energies of the Indian Medical Service in the future may have to be devoted, apart from their definitely official duties, to the education of the community through qualified Indian doctors.

THE RECOVERY OF THE LONDON HOSPITALS.

THERE is much that is comforting and encouraging in the annual report of King Edward's Fund upon the work and finances of the 118 London hospitals during 1924 which has just been issued. Not the least significant of its masses of figures are those which show that the number of beds has grown by 350 during the 12 months—practically a new bed every day—and that the number available in London is 1620 more than in the year before the war. With the very recent report of the Voluntary Hospitals Commission on bed capacity before us, it is obvious that the accommodation is still much too small, but so substantial a growth in a single year is a remarkable indication of the resiliency of the voluntary system. Income has kept pace with expenditure in an almost exact ratio—both are, roughly, double what they were in 1913. When, however, we compare 1924 with 1923 we find that maintenance expenditure has gone up £123,000 whereas income has increased by less than half that amount. Nevertheless, the aggregate deficits of 1920, 1921, and 1922 have, during the last two years, been changed into aggregate surpluses, and the number of hospitals with deficits fell from 77 in 1920 to 54 in 1924. That is still far too many, yet if the present rate of

progress can be continued, in another few years minus quantities will be almost unknown in London hospital finance. The need of money for building, equipment, and endowment remains, and is likely long to remain, very serious, but here again the prospect is distinctly encouraging. During the last three years not far short of a million and a half has been given for these purposes.

Voluntary gifts are still the rock upon which hospital expenditure is based, and it must necessarily always be so. These gifts last year provided 37 per cent. of the aggregate income, but they are now being run rather closely by patients' payments, which in 1924 reached 29 per cent. of the receipts. This is a figure that is ever growing all over the country, and the more it grows the stronger the voluntary position will become. It is hopeless to expect that great hospitals can "live on their means," and last year their investment income was only one-fifth of the total. Ten years hence the demand upon the resources of the hospitals will be even heavier than at present. It is therefore important to consider the possibilities of reducing expenditure in directions that will not impair their usefulness, and Sir Mackenzie Chalmers has just renewed the suggestion to which we gave support a few months ago, that they should be relieved of a proportion of the heavy burden of local rates. It is understood that the London hospitals pay close upon £40,000 a year in rates, and there is a strong claim for their all-round reduction by, say, one-half—since they clearly derive benefit from local expenditure the case for total exemption would not be strong. Then there is the old story of the death duties on bequests to hospitals—duties which not only rob the hospitals but discourage testators, since both the institution and the dead man's estate suffer. Lord Cave's Committee some four years ago recommended that bequests to hospitals should be exempt from the 10 per cent. legacy duty on the ground that "there appears to be no good reason why the State should intercept at the source one-tenth of all sums bequeathed for the benefit of the sick." Since then more than one Chancellor of the Exchequer has refused to honour a recommendation which, it is believed, would help the hospitals to the extent of about £100,000 a year without raising any of the thorny questions implicit in more direct forms of State aid.

THE INTERNATIONAL CONGRESS ON CHILD WELFARE.

THE first International Congress on Child Welfare has been held during the past week in Geneva, and the various factors in the well-being of the young have been taken into consideration from international aspects. With regard to the diminishing of infant mortality, some of these may well be beyond human power; for example, Dr. Afifi, speaking as an official delegate of the Egyptian Government, stated that the excessive heat of the summer in Egypt was responsible to a large extent for the increased mortality of infants during the months of June, July, and August. The infant mortality in Egypt is certainly very high, for the last figure which we have seen was 143 per 1000 births; but before the sacrifice of life thus implied can be attributed to the climate it is necessary that we should have analogous figures for comparison collected from other countries having as wide a range of temperature as prevails in Egypt. The season of the year when the deaths occur is another point which might well have been brought before the Congress, and no doubt in future meetings subjects like this, of wide international relevance, will be set down for discussion. According to Dr. Afifi it is noticeable that in Egypt the infant death-rate per 1000 has gone up steadily for some years, almost in proportion to the increase of the population, which is simply a proof of his own statement that it is the conditions prevalent in the cities which are responsible for the sacrifice of child life.

Annotations.

"Ne quid nimis."

ROYAL COLLEGE OF SURGEONS IN IRELAND.

A RESOLUTION was unanimously adopted at a special meeting of the Council of the Royal College of Surgeons in Ireland, expressing high appreciation of the conduct of Mr. R. C. B. Maunsell, the President, in the recent controversy, and confidence of his defence of the interests of the College. The Council then considered the whole situation, which has arisen under the decision to institute a separate medical register for the Irish Free State, taking note of many suggestions from various sources that they should intervene in the political issues. The Council, however, decided, seeing that the medical profession in Ireland have never interfered in any way in politics, to fight the matter by educating public opinion, and only thus influencing politicians. As a beginning of the education of the public they have decided to convene a meeting of medical practitioners on Sept. 8th in the Examination Hall of the College.

OCCUPATIONAL DISEASES OF SEAMEN.

Dr. H. Ruge, Marinestabsarzt (Surgeon Lieutenant) in the German Navy, in some interesting articles published in the *Marine Rundschau*, observes that when diseases of seamen came prominently into notice in the age of the great voyages of discovery the first and worst was scurvy. Next in importance were the infective diseases: Typhus (ship-fever), typhoid, dysentery, and in the tropics yellow fever and malaria. The number of sick was almost incredible in these early expeditions. In 1757 a French expedition, as it sailed, sent 400 typhus cases ashore at Brest from two of its ships. A thousand were landed at Louisbourg on arrival, survivors were re-embarked in autumn, and when the ships reached Brest there were 4000 sick in the fleet, while hundreds had died during the passage. Hosier in 1726, off Colon, lost his personnel twice over from yellow fever. Little was known definitely about prevention, but Cook (1772-5) and La Perouse (1785-8) had hardly a man sick in their voyages. The food was unbelievably bad; the water was no better. It was not till 1815 that iron tanks began to replace the old decaying wooden casks. To make the dirty, stinking water tolerable it was mixed with rum, of which each man was issued with 5 oz. daily. Thereon alcoholism began to rage. Rouppe (1764) calls delirium tremens the characteristic disease of seamen, but improvement set in in the latter half of last century, and the disease is now rare.

Dr. Ruge classifies the sickness of the modern German Navy in four main groups: Chills, mechanical injuries, inflammations of connective tissue, and venereal disease. Under "chills" are included tonsillitis, sore-throat, bronchial catarrh, pleurisy, acute catarrhal, gastric and intestinal attacks, and rheumatism of muscles or joints. Chills are more common afloat than ashore (as 75 to 65), more frequent in iron than in wooden ships (as 3 to 2 in 1893-7), and it is the engine-room, or rather the stokehold, staff that suffer most, and he comments that these men should always wear jerseys when on deck in cold weather; steam heating of the ship also lessens risk. Mechanical injuries cause much loss of time. They are more frequent and more dangerous in sailing ships, but these ships are becoming few. The mortality of accidents in sailing ships is 30 per cent., in steamships 5 per cent. But most accidents nowadays occur about the guns, and sailors are the victims; there are few accidents in the engine-room. Recruits and men new to the ship suffer most, and accidents are more frequent on Mondays, lessening as the week goes on. This is due to unwisely-spent leave at week-ends, when, too, venereal disease is most often acquired. Eighty-five per cent. of accidents

occur on duty. Many might be prevented by improved construction of ships, but accidents there will always be where people are working hard. Men in ships are fortunate in having a doctor at hand when they are injured, so that wounds need not become septic. Boils cause much loss of service; they are generally on the arms, and attack sailors more than stokers. They are at their maximum in summer but have a second maximum in autumn, when the recruits join. The recruits are very susceptible, probably because they are constipated. Cleanliness is the best protection against boils, and once they have a hold on the ship, the ship should be disinfected. Three-quarters of the venereal infections are contracted by men under the influence of alcohol. At Hamburg, Nocht found 7000 cases of venereal disease in three years aboard ships entering the port. The East Asiatic Squadron has had one-third of its force at one time under treatment. Sailors suffer much from syphilis, and the worst infected women are at the ports. Unlike alcoholism, venereal disease has decreased little since the war. The men in the German Navy are warned, preventives are always available for them; the merchant seaman is less protected. Dr. Ruge's article deals interestingly with a subject too little discussed.

PYELITIS IN INFANTS.

CASES of pyrexia occurring in infants of a few days or a few weeks old are frequently difficult to diagnose and troublesome to treat. They may, and usually do, have most symptoms referable to the alimentary tract such as anorexia, loss of weight, and vomiting. The fever or other manifestations of general constitutional disturbance may persist in an exasperating way for weeks and finally clear up without any diagnosis having been made, or any treatment, except "symptomatic," having been suggested. Some light has been shed on the possible cause of many of these cases in a discussion led by Dr. L. W. Sauer, of Evanston, Illinois, before the recent American Medical Association Session at Atlantic City.¹ He quotes 12 cases of his own, and three of Helmholtz, in which the infants, varying from 6 to 28 days old at the probable onset of the disease, suffered from pyelitis; and he arrives at the following conclusions: (1) Neonatal pyelitis is probably a periodic disease occurring more frequently in male infants. (2) Gastro-intestinal symptoms, especially vomiting, anorexia, diarrhoea, and tympanites predominate. (Other of the more common clinical features noted are pyrexia, loss of weight, pallor, and constipation.) (3) The urine is invariably strongly acid and contains pus, *B. coli*, and a variable amount of albumin. Under the low-power lens numerous polymorphonuclear leucocytes, epithelial cells, erythrocytes, and perhaps casts are seen even in uncentrifuged urine when fresh. (4) The disease, when free from complications, usually responds within six weeks to diuresis and continued alkalinisation of the urine. (5) The infection is probably by way of the blood-stream, the organism being pathogenic enteric *B. coli*. Diagnosis is not easy in the early stages, for various reasons, and it may be difficult in private practice to obtain a sample of the urine. Also it is known that while the pyrexia lasts there may be only one or two pus cells in the urine—scarcely sufficient to establish a diagnosis—and only when the temperature is nearing normal may there be an outpouring of sufficient pus to make the condition easily recognisable by microscopic examination. This raises the question as to whether the condition may be primarily and not secondarily a colon infection, especially as the symptoms are referable to the alimentary tract before pyuria is present. Alkalies are recommended in the treatment of such cases, though doubt has been cast on whether they are valuable in themselves or only in so far as they promote diuresis. Certainly the abundant use of plain water is advisable. Other measures suggested are careful regulation of the milk

or other food, the administration of hexamine, and, in cases of extreme anorexia and vomiting, occasional stomach lavage, subcutaneous salines, and rectal feeding. It is possibly advisable to continue the administration of alkalies for several weeks after the urine is free from pus, albumin, and bacilli. In cases of troublesome diarrhoea the treatment of acute enteritis should be followed—e.g., castor oil, starvation for 24 hours, sips of sterile water, and a few minims of brandy alone being given; then albumin water, chicken tea, and so forth, until it is considered safe to begin with very dilute milk or other food of low carbohydrate content. The prognosis is good. Thirteen of the 15 cases quoted by Dr. Sauer recovered. Of the two exceptions, one was complicated by meningitis, and the other by congenital stenosis of the right ureter, with multiple abscesses of both kidneys, and *B. coli* septicæmia. Finkelstein, in 1924, reported that he had frequently diagnosed pyelitis within the first two weeks of life. Apart from his work and that of Helmholtz there is little literature on the subject, but the condition is probably much more common, in milder degrees at any rate, than is generally supposed. Certainly it is possible that many cases of pyrexia in infants, which clear up in a most gratifying way when a mixture containing a little sodium bicarbonate and flavouring matter is administered, may be due to pyelitis.

QUINIDINE IN MALARIA.

A RECENT publication of the United States Public Health Service¹ shows that the death-rate from malaria from 1919–23 still ranges as high as 40 and 50 per hundred thousand in some of the Southern States, although there is encouraging evidence that the disease is gradually disappearing and constantly becoming confined within narrower geographic limits. Some years ago a committee was appointed by the Medical Research Council to inquire into the value of quinine derivatives. The reputed toxicity of cinchonine and the previous reports of Major H. W. Acton, I.M.S., on the value of quinidine decided the committee to confine its inquiry to the properties of the latter alkaloid. Naturally, the conduct of this investigation was beset with many difficulties. Since the committee had no long series of malarial patients in a malaria-free country on which to experiment, the test took the form of a comparison of the relative efficacy of quinine and quinidine in causing disappearance of the parasites from the blood during an acute attack, and were carried out by medical officers in various centres.² Reports have been received from Palestine, Khartoum, British Guiana, Uganda, and the Federated Malay States, and all suggest that quinidine is at least as efficacious as quinine, but do not support Major Acton's original suggestion that quinine is definitely inferior to quinidine in the benign tertian infection, though specific for the malignant subtertian parasite. The contribution thus made is a small one, but should lead on to further and extensive observations. It deposes quinine from the position of unique value which practice and tradition have accorded to it among the cinchona alkaloids. The depressant effect of quinidine on the heart may constitute a real drawback to its employment, but the committee have reason to think that the reputed toxicity of cinchonine is due to impure specimens, and a small supply of carefully purified cinchonine has been sent out for trial at Kuala Lumpur. A systematic comparison of these alkaloids, particularly cinchonine and cinchonidine, is very much to be desired. If the suggestions made in this preliminary report are confirmed, it will form a most valuable contribution to medical science, for if an indefinite mixture of the alkaloids could replace quinine the problem of cheapening the supply of antimalarial remedies would be much simplified. Interest in the experiments is not confined to malaria-

¹ Jour. Amer. Med. Assoc., August 1st, 1925, p. 327.

¹ Reprint No. 926, Public Health Reports. Government Printing Office, Washington, U.S.A. 5 cents.

² Medical Research Council, Special Report Series No. 96. H.M. Stationery Office. 1s.

infested countries, since the efficient control of benign tertian malaria is of great importance to British psychiatrists in connexion with the treatment of general paralysis by the Wagner-Jauregg method.¹

INOCULATION AGAINST MEASLES.

Dr. Arturo Atria, of Santiago de Chile, has written a book² advocating the universal adoption of the practice of inoculation against measles. As physician-in-chief of the Section of Bacteriology at Santiago and a late student of the Pasteur Institute he speaks with a certain authority, and he invokes the support of tradition by giving considerable space to enthusiastic eulogy of Home, a Scottish physician of the eighteenth century, who first experimented with inoculation about 1740 on a small scale. Home was certainly an able man, much in advance of his age, but the number of his cases was far too small to admit of any deduction being made from the results, and his work is only of historical interest. Nor does the amount of work done since on the same lines come anywhere near to justifying the sweeping conclusions arrived at by Dr. Atria. His attitude may be judged of from the fact that he speaks of 1150 cases as being a colossal number, whereas to arrive at any definite judgment we should need thousands of cases, carefully observed during a period of years. No evidence is offered as to how long the effects of inoculation last in conferring immunity, nor does the author seem to weigh the very varying degrees of liability in communities and individuals in considering such statistics as he has got. Dr. Atria advocates wholesale case-to-case inoculation with the blood of individuals at a certain stage in the disease, but he does not face adequately the difficulties and dangers of the course that he proposes. Two obvious ones may be mentioned: (1) As the virus cannot be stored, large numbers of cases would be required from which to inoculate, and there would be a constant risk of imparting some other disease, such as syphilis or tubercle. (2) As the constitutional reaction in effective cases is presumably more severe than in ordinary vaccination, very large provision would have to be made for nursing and medical attention if the results are not to be disastrous. It is a pity that so much time and energy have been expended in advocating what in the present state of our knowledge can only be characterised as wholly premature. The bibliography, which has neither chronological nor alphabetical order, shows that a very large number of works has been consulted, but all that is of value in the book might well be compressed into one-tenth of the space occupied.

BRITISH HYDROLOGY.

INCREASED attention is being paid to the organisation of British spas, which, although differing in ranges of altitude and temperature from those abroad, do offer in a large number of cases amenities which not only compare favourably with many continental spas in the matter of treatment and comfort, but also save the expense and inconvenience which foreign travel may mean to many patients. During the war, when continental spas were no longer available to British visitors, and when the indicated treatment for many war victims was that provided by baths, the British waters had perforce to be resorted to, with the result that a somewhat neglected branch of medical science and practice in this country received a great impetus. During the past three years a course of lectures on medical hydrology has been given at the London University, arranged by the board to promote the extension of university teaching, and in co-operation with the Committee for the Study of Medical Hydrology in Great Britain. The fee for the course is £1, and in the week during which the course is held, usually at the end of April and the beginning of May, visits are made to, and

demonstrations given at, some of the hydropathic centres of the country. Taken in connexion with the work of the British Spa Federation, which includes some of the leading spas complying with a certain standard of efficiency, the lectures are a step towards the organisation of British spas on lines laid down by Dr. Fortescue Fox in *THE LANCET* last year.¹ These were: (1) the co-ordination and development of British waters, under medical authority; (2) post-graduate lectures in hydrology at the universities; (3) facilities at one university for the systematic training of hydrologist practitioners. Particulars of the lectures and demonstrations can be obtained from Miss Hilda Fox, care of University Extension Department, University of London, South Kensington, S.W.7.

THE DOCTOR OF THE FUTURE.

UNDER this title Dr. George E. Vincent, the President of the Rockefeller Foundation, discusses the trend of medical practice in the United States. At present the mass of the population, "perhaps 75 to 80 per cent., are treated by general practitioners who have limited technical appliances, little or no specialisation of skill, and slight relation to medical services organised in hospitals, dispensaries, and clinics." Among the forces now at work which will modify the present state of things is the growth of preventive medicine which, by reducing sickness, will limit the material for curative practice. The high cost of sickness is leading to a demand for insurance. The character of a modern medical education is depleting the rural areas of their physicians. Already four types of doctors have emerged from the modern crucible according to Dr. Vincent, who classifies them as follows: "(1) the professorial doctor who teaches and investigates; (2) the specialist; (3) the socialised or full-time salaried doctor; and (4) the individual, independent, general practitioner." Can the latter type, still the most important numerically, continue to survive? he asks, with his increasingly difficult handicaps. While his disappearance would be a serious loss, Dr. Vincent evidently does not look on it as an impossibility. As conditions of survival he postulates co-operation in the use of laboratories and other resources, willingness to take part in insurance schemes, and above all readiness to become a practitioner of preventive medicine.

THE DIPLOMA IN TROPICAL MEDICINE.

IN the Students' Number of *THE LANCET* under this heading it is stated that systematic instruction for these diplomas is given at the London School of Tropical Medicine, at 5, Endsleigh-gardens, London, N.W. The old London School of Tropical Medicine now forms the Tropical Division of the London School of Hygiene and Tropical Medicine, and the address is 23, Endsleigh-gardens, Euston-road, N.W.1, and not 5. An account of the activities of the new body was given in *THE LANCET* of June 27th, 1925 (p. 1354).

Sir StClair Thomson has been appointed hon. consulting laryngologist to the Italian Hospital, London.

Dr. T. Vincent Dickinson has been elected Master of the Society of Apothecaries, one of the oldest of the City Livery Guilds.

¹ Vide *THE LANCET*, 1924, ii., 884, 885.

EXTENSION OF KIDDERMINSTER HOSPITAL.—In commemoration of his silver wedding the Prime Minister has given £5000 towards the £25,000 required for alterations and additions to Kidderminster District General Hospital, and Mrs. Baldwin recently laid the foundation-stone of the extensions. The scheme embraces an out-patients' department with consulting room, a dispensary, an operating room, a new ward for 40 children, and a laundry.

¹ *THE LANCET*, August 22nd, 1925.

² *Profilaxis del Sarampion*. By Arturo Atria. La Illustration Press. 1925. Pp. 351.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

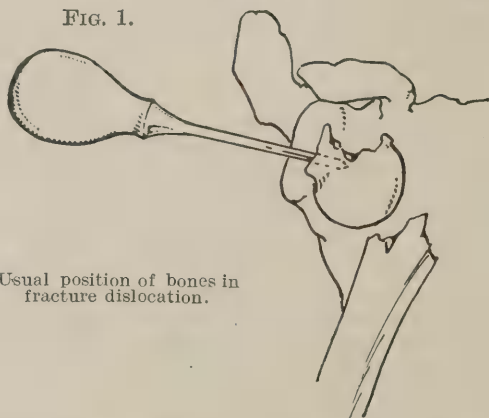
CXXXVII.—FRACTURE DISLOCATIONS OF THE UPPER END OF THE HUMERUS.

THIS complicated injury is fortunately a rare one. It is caused by direct violence upon the shoulder; the same blow which forces the head of the humerus out of the glenoid cavity breaks the neck of the bone. From this it follows that the fracture is often comminuted and that the head is usually rotated so that its axis in no way corresponds with that of the shaft. In this, as in the majority of juxta-articular fractures, a good result can only be obtained by early and exact diagnosis. The severity of the injury will cause so much pain, swelling, and distortion of the shoulder that there ought to be no excuse for neglecting thorough examination.

Dangers of Diagnostic Error.

There are two very real dangers of serious error. One is that of simply putting up the arm with sling and bandage without making an exact diagnosis. In the first place this is done by way of "first-aid" and then, the patient being fairly comfortable, a policy of procrastination is followed for days and then

FIG. 1.



Usual position of bones in fracture dislocation.

weeks, and when the true nature of the disaster is brought to light by the fixed and painful shoulder on which the X rays are turned for the first time, the chance of cure has passed by and a judge and jury are invited to the consultation.

The other likely mistake is to recognise the dislocation, by the emptiness of the glenoid cavity and the sagging inwards of the deltoid beneath the acromion, but to overlook the fracture. If then an attempt to treat the dislocation is made, a spurious reduction may be effected by forcing the shaft of the bone into the shoulder-joint and there leaving it. This mistake should be avoided by noticing that the head of the bone does not rotate with the shaft, and that crepitus is often elicited. Of course, the use of the X rays within the first 24 or 48 hours of the accident should be regarded as absolutely essential, and the fact that this rule is so often neglected, with disastrous results, affords a most puzzling comment on the mentality of doctors, who thus carelessly endanger the patient, themselves, and the reputation of the profession.

The X ray picture ought to afford a clear indication as to the nature of the injury. The glenoid cavity is empty, the neck of the bone is broken, and the upper fragment is distorted so that its fractured surface is turned away from that of the shaft. (Fig. 1.)

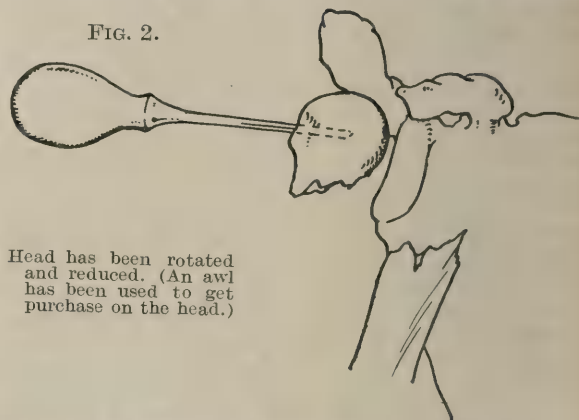
Open Operation and Reduction.

When these facts have been made clear, immediate arrangements should be made for open operation and reduction in a suitable institution. There is

no alternative to operative treatment which can afford any hope of a good functional arm, and there is nothing gained by delay or the adoption of any temporising measures.

It is impossible to reduce the dislocation by any manipulation of the arm, because the continuity of the head and shaft of the humerus is broken.

FIG. 2.



Head has been rotated and reduced. (An awl has been used to get purchase on the head.)

It is useless to wait for consolidation of the fracture and then to hope for reduction of the dislocation, because the alignment of the fragments is so faulty that only gross malunion can occur, and when it has occurred the torn capsule will be so united by scar-tissue as to make reduction impossible.

The operation for this injury involves the consideration of three main points—viz., adequate exposure, reduction of the head, and fixation of the fracture. Exposure should be by the ordinary anterior incision along the anterior border of the deltoid muscle. The cephalic vein is exposed and ligatured. Having made a three-inch incision and investigated the underlying conditions, it will probably be of advantage to prolong the incision upwards along the deltoid border to the clavicle, and then to cut outwards towards the acromion. The clavicular origin of the deltoid is cut and the muscle turned outwards. The capsule of the joint may be so much torn that no further division is necessary in order to get at the head of the bone. Otherwise the capsule should be divided by a vertical incision along the line of the long head of the biceps. The humeral head now being exposed, the difficulty consists in

FIG. 3.

FIG. 4.



Fracture treated by simple impaction.



Fragments shaped for impaction.

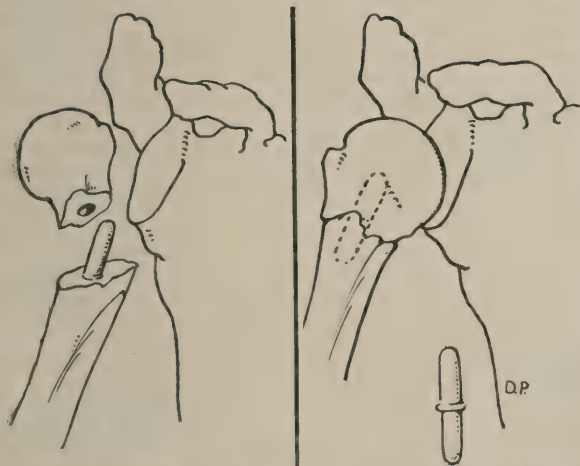
putting it back into the glenoid cavity and in rotating it into correct alignment. Probably the tendon of the subscapularis will already be torn, but it ought not to be necessary to cut any of the short rotators unless the operation is being done several weeks after the accident. Manipulations of the head of the bone may be effected by means of a shoe-horn elevator

or by transfixing it with a stout bone-drill on a handle. (Fig. 2.)

When the head has been restored to its socket with its broken surface directed towards the axis of the arm, fixation of the fracture can be effected. In most cases this fixation does not require any special apparatus. The fracture is recent and the ends of the bone are jagged. All that is necessary is by traction and leverage to fit the ends together (Fig. 3), when the tension of the muscles may be trusted to keep them in apposition. If the bone ends are oblique or have become so smooth that they will not lock, then some impaction may be necessary. Often the shaft will present an outstanding point which may be trimmed up and forced into a cavity gouged out of the head. (Fig. 4.) Or else an intra-medullary peg, two inches long and a quarter of an inch thick, with a central stop may be used. This is first hammered tightly into the shaft and the projecting end is manoeuvred into a hole drilled in the axis of the head. (Figs. 5 and 6.) Whatever method of fixation is used, great care should be taken to secure correct orientation of the fragments in regard to rotation. The operation is concluded by suturing of the capsule, the clavicular origin of the deltoid and the skin. The arm is put up in moderate abduction for the

FIG. 5.

FIG. 6.



first few days with an axillary pad and a sling. Then, when the patient can sit up the arm is put on to an abduction splint, which is retained for four to six weeks. After the first ten days the splint is removed daily for exercise and massage.

If the patient's condition contra-indicates a general anaesthetic, the operation may be performed under local anaesthesia, by infiltrating the brachial plexus with 2 per cent. solution of novocaine. If the patient refuses an open operation, then the arm should be put up in full abduction from the outset.

Late Operation.

If the nature of the case has been overlooked, and treatment has to be undertaken six weeks or more after the accident, then an attempt may be made to carry out the reconstructive operation above described, but it will seldom be found possible because the head of the bone has become so fixed and also so atrophied. Under these circumstances the head must be removed, whilst the shaft, which may be rounded off, is placed in the glenoid cavity. But at the best this operation will only secure a weak joint for which a subsequent arthrodesis may have to be done.

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STUDENTS' GUIDE—SESSION 1925-26. DENTAL SURGERY.

APPEARANCE on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma.

In THE LANCET of August 29th we outlined the constitution of the Dental Board of the United Kingdom, and the regulations in regard to the registration of dental students.

The Examining Bodies in Dentistry which grant degrees or diplomas in the subject are as follows:—

Royal College of Surgeons of England.—Licence in Dental Surgery.

Royal College of Surgeons, Edinburgh.—Licence in Dental Surgery. The College also grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification.

Royal Faculty of Physicians and Surgeons of Glasgow.—Licence in Dental Surgery. The curriculum, which is similar to that of Edinburgh, includes in addition dental bacteriology.

Royal College of Surgeons in Ireland.—Licence in Dental Surgery.

University of Birmingham.—Dental licence; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Bristol.—Licence in Dental Surgery; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Durham.—Licence in Dental Surgery; degrees of Bachelor of Dental Surgery (B.D.S.) and of Master of Dental Surgery (M.D.S.).

University of Leeds.—Licence in Dental Surgery; degrees of Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.).

University of Liverpool.—Licence in Dental Surgery; (L.D.S.); degrees in Dental Surgery (B.D.S. and M.D.S.).

University of London.—Degree of Bachelor in Dental Surgery.

University of Manchester.—Degrees of B.D.S.; and a licence in Dentistry.

University of Sheffield.—Degree of Bachelor of Dental Surgery; and the diploma of Licentiate in Dental Surgery.

Queen's University of Belfast.—Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery.

In the following syllabus the respective requirements of the various examining bodies in dentistry are set forth, together with the facilities for dental study offered by certain other institutions.

THE EXAMINING BODIES IN DENTISTRY.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND grants a diploma in Dental Surgery under the following regulations, which apply to all candidates who have passed the required Preliminary Examination in General Education before Jan. 1st, 1923.

Candidates are required to pass three examinations: the Preliminary Science Examination, the First Professional Examination, and the Second Professional Examination. 1. Preliminary Science Examination.—This is identical with Part I. of the First Examination of the Examining Board in England. Candidates must pass the Preliminary Science Examination before commencing the courses required for the Second Professional Examination. 2. The First Professional Examination.—The candidate must produce evidence of instruction in Dental Metallurgy and Practical Dental Mechanics. The Examination consists of Part I. (Mechanical Dentistry), Part II. (Dental Metallurgy and the Properties of Dental Materials), the examination in Dental Metallurgy being by written paper, and Part III. (a) General

Anatomy and Physiology, (b) Dental Anatomy and Physiology conducted by papers and vivâ voce examination. The parts may be taken together or separately. 3. The Second Professional Examination.—This is divided into two parts: (a) the General, (b) the Dental. The General part must be passed before the Dental portion. The instruction is obtained partly at a General Hospital and partly at a Dental Hospital. The Second Professional Examination consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery. There is a written and vivâ voce examination in each part and a practical examination as well in Part II. Exemption from the Preliminary Science Examination is granted to candidates who have passed an Examination in Chemistry and Physics for a degree in Medicine at a University in the United Kingdom, in India, or in a British colony. Exemption from Examination in Anatomy and Physiology is granted to candidates who have passed the Second Examination of the Examining Board in England or the corresponding Examination for any degree or qualification in Medicine or Surgery registrable under the Medical Act of 1886. Exemption from Examination in General Surgery and Pathology is granted to candidates who have passed the Examination in Surgery of the Examining Board in England or the corresponding Examinations of the Universities above mentioned. The fee for the diploma is 20 guineas, and is payable as follows: Preliminary Science Examination, for each admission to Part I., £3 3s.; Part II., £2 2s. First Professional Examination, for each admission to Part I., £4 4s.; Part II., £1 1s.; Part III. (a) £2 2s.; (b) £2 2s.; Second Professional Examination, for each admission to Part I., £2 2s.; Part II., £4 4s.

The following Regulations apply to all candidates who pass the Preliminary Examination in General Education on or after Jan. 1st, 1923.

1. Candidates for the Licence in Dental Surgery of the Royal College of Surgeons of England are required to pass one of the Examinations in General Education recognised by the Conjoint Examining Board in England, and the Pre-Medical Examination in Chemistry and Physics conducted by that Board or one of the examinations recognised in lieu thereof, before they commence the curriculum of professional study for the Licence extending over four years.

2. Candidates who produce evidence of having been registered by the General Medical Council as Medical or Dental Students on or after Jan. 1st, 1923, will be considered to have passed the required Preliminary Examination in General Education and the Pre-Medical Examination.

3. Candidates who hold the degree of D.M.D. Harvard, D.D.S. Pennsylvania, D.D.S. Michigan, D.D.S. Illinois, D.D.S. St. Louis, Missouri, D.D.S. Northwestern University, Chicago, D.D.S. Minnesota, D.D.S. Tufts College, Boston, B.D.S. Sydney, or the Licence of the Dental Board of Victoria, Australia, are not required to pass these Examinations.

First Professional Examination.—1. The First Professional Examination consists of Part I. Dental Mechanics, Part II. Dental Metallurgy and the Properties of Dental Materials and Part III. Section (a) General Anatomy and Physiology, Section (b) Dental Anatomy and Physiology, and is held in January or February, April, and September or October in each year.

2. Candidates may present themselves for the several Parts of the First Professional Examination together or separately, but before admission to any part of the Examination they must produce evidence of having passed the required Preliminary Examination in General Education and the required Pre-Medical Examination or a certificate of having been registered as a Medical or Dental Student by the General Medical Council.

Part I. Dental Mechanics.—3. This Examination is a practical one, conducted in the Mechanical Laboratory of one of the Dental Hospitals in London.

4. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward certificates:—

(1) Of having been engaged during a period of not less than two years in acquiring a practical familiarity with the details of Dental Mechanics. One year at least of this study must be taken in the Mechanical Department of a recognised Dental Hospital where the arrangements for teaching Dental Mechanics are satisfactory to the Board of Examiners in Dental Surgery. Part or the whole of the rest of the course may be taken as a pupil with a competent dentist provided that time spent as a private pupil shall be at least twice the time required for the corresponding instruction* taken at a Dental School.

(2) Of having attended at a recognised Dental Hospital and School: (a) A course of lectures on Dental Mechanics; (b) a course of Practical Dental Mechanics, including the manufacture and adjustment of 6 dentures and 6 crowns.

6. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having received three months further instruction under the conditions specified in Certificate (1) paragraph 4.

Part II. Dental Metallurgy and the Properties of Dental Materials.—7. This Examination is conducted by written paper.

8. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward a certificate:—Of having attended at a recognised Dental Hospital and School: (a) A course of lectures on Dental Metallurgy; (b) a course of Practical Dental Metallurgy.

9. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having worked in a Dental School, to the satisfaction of the Dean, for a further period of three months.

Part III. (a) General Anatomy and Physiology, (b) Dental Anatomy and Physiology.—10. This Examination is partly written and partly oral.

11. Candidates may enter for Section (a) only or for Sections (a) and (b) together on producing the required certificates, but they will not be allowed to proceed with Section (b) until they have passed in Section (a). In the case of a candidate who enters for both Sections and fails in Section (a) the fee paid for admission to Section (b) will not be forfeited, but will be credited to the candidate on readmission to examination in that Section. Candidates who enter for both Sections together may pass in Section (a) although failing to pass in Section (b).

12. Candidates must give 21 days' notice in writing of their intention to present themselves for the whole or for one Section of this examination and at the same time forward certificates:—

(1) For Part III. (a). Of having attended at a recognised Medical School: (a) Courses of instruction in Anatomy, including special demonstrations on prepared dissections during three terms; (b) a course of dissections to include, if possible, the head and neck, during one term; (c) courses of instruction in Physiology, including General Biology, Biochemistry, and Biophysics, during three terms; (d) a course of instruction in Histology.

(2) For Part III. (b). Of having attended at a recognised Dental School: (a) A course of instruction in Dental Anatomy and Physiology; (b) a separate course of instruction in Dental Histology, including the preparation of Microscopical Sections.

13. A candidate referred at this examination who does not hold a registrable Dental Qualification will be required, before readmission to Section (a), to produce a certificate of three months' additional study of Anatomy and Physiology at a recognised Medical School, and will be required before readmission to Section (b) to produce a certificate of having worked

* This instruction may be taken prior to the date of passing the Examination in General Education and the Pre-Medical Examination, but will not be counted as part of the required four years of professional study unless taken after passing the Pre-Medical Examination.

in a Dental School, to the satisfaction of the Dean, for a further period of three months.

14. Exemptions.—Candidates who have passed Section I. of the First Professional Examination of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Anatomy and Physiology for a degree, or other qualification, in Medicine or Surgery, registrable under the Medical Act of 1886, or for the degree of M.B. or M.D. of a Foreign or Colonial University recognised by the Conjoint Examining Board in England, are not required to pass Section (a).

Second Professional Examination.—1. The Second Professional Examination is held in February, May or June, and November in each year, and consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery.

2. Candidates who have passed the First Professional Examination at least six months† previously may present themselves for Part I. only on producing the certificates mentioned in paragraph 6 of this section, or they may enter for the whole Examination at one time on producing the certificates mentioned in paragraphs 6 and 10 of this section.

3. Candidates must pass in Part I. before proceeding to Part II.

4. Candidates who enter for the whole Examination at one time may pass in Part I. although failing to pass in Part II.; but if they fail to pass in Part I. they will not be allowed to proceed with the Practical and Oral Examinations in Part II. In such cases the fee paid for admission to Part II. will not be forfeited, but will be held over until such time as the candidate is readmitted to examination in that Part.

Part I. General Surgery and Pathology.—5. This Examination is partly written and partly oral.

6. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates:—

(1) Of having attended at a recognised Medical School: (a) A course of instruction‡ in Surgery during two terms; (b) a course of instruction in Medicine during two terms; (c) a course of instruction in General Pathology (including Bacteriology) during two terms. (2) Of having acted as Surgical Dresser in the Out-patient Department of a recognised Hospital for three months. (3) Of having attended, at a recognised Hospital or Hospitals, the practice of Medicine and Surgery, including clinical lectures, for 12 months. (4) Of being 21 years of age.

7. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of such additional study during three months at a recognised Medical School and Hospital as the Teachers of the School may determine.

Exemptions.—8. Candidates who are Members of the College or who have passed the Examination in Surgery of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Surgery for a Degree, or other Qualification in Medicine or Surgery registrable under the Medical Act of 1886, are not required to pass Part I. of the Second Professional Examination.

Part II. Dental Surgery and Pathology.—9. This Examination is partly written, partly oral, and partly practical. The oral examination is conducted by the use of preparations, casts, drawings, &c. At the practical examination candidates may be examined:—

(a) On the treatment of Dental Caries, on the preparation and treatment of teeth by filling with gold or other material, by inlaying or by crowning, and on other operations in Dental Surgery. (Candidates must provide their own instruments.) (b) On the treatment of abnormalities of position of the teeth of children. (c) On Clinical cases.

† The interval of six months is not required in the case of a colonial or foreign dentist.

‡ These courses of instruction must be attended after the completion of the courses in Anatomy and Physiology.

10. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates:—

(1) Of having been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a Medical or Dental Student, or of having passed the Pre-Medical Examination conducted or recognised by the Conjoint Examining Board in England. (2) Of having attended at a recognised Dental Hospital and School: (a) A course of Dental Surgery and Pathology; (b) a separate course of Practical Dental Surgery; (c) a course of Dental Bacteriology; (d) a course of Dental Materia Medica; (e) a course of practical instruction in the administration of such Anæsthetics as are in common use in Dental Surgery. (3) Of having attended at a recognised Dental Hospital and School, or in the Dental Department of a recognised General Hospital, the practice of Dental Surgery during two years.

11. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required before admission to re-examination to produce a certificate of three months' additional study at a recognised Dental Hospital.

Fees.—The fee for the Diploma in Dental Surgery is 20 guineas.

Synopses of examinations and all further information can be obtained from the Director of Examinations, Examination Hall, Queen-square, London, W.C. 1.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.—Regulations giving a list of Preliminary Examinations recognised for obtaining the Licence in Dental Surgery, as well as of the subjects of the Professional Examinations, may be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, at 49, Lauriston-place, Edinburgh. Candidates must produce certificates of having, subsequently to the date of registration, been engaged for four years in professional studies and of three years' instruction in Mechanical Dentistry from a registered dental practitioner, except in the case of previously registered medical practitioners, when two years will be considered sufficient. Candidates must also have attended a course of instruction at a University or in an established school of medicine or in a provincial school specially recognised by the College as qualifying for the Diploma in Surgery. In addition they will be required to have attended in a recognised dental hospital, or with teachers recognised by the College, special courses of lectures and instruction in Anatomy and Physiology (Human and Comparative), Surgery, Pathology, Materia Medica, Dental Histology, and Practical Dental Mechanics and Metallurgy; two years' attendance at a dental hospital or the dental department of a general hospital recognised by the College. Practical instruction in Mechanical Dentistry from a registered Dentist, or in the Mechanical Department of a recognised Dental Hospital and School, for three years. Candidates who have passed the First and Second Examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the subsequent Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the First and Second Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are Licentiates of this College or who may be registered medical practitioners will be required to produce certificates of attendance on the special subjects only and will be examined in these only for the dental diploma. First Professional Examination: The candidate must have attended the required courses. The examination embraces (1) Chemistry and Physics; and (2) Anatomy and Physiology. The fee is £5 5s. for the complete examination, and £3 3s. is payable for each division. In all cases of rejected candidates the fee for re-entry is £3 3s. Second Examination: The candidate must have attended the remaining courses of the curriculum, must produce certificates showing that he is 21 years of age, and must pay a fee of £10 10s.,

for re-entry £5 5s. The examination embraces (1) Surgery and Medicine; and (2) the special subjects of Dental Anatomy and Physiology, Dental Surgery and Pathology, Dental Materia Medica, Dental Mechanics and Dental Metallurgy, with a practical as well as the written and oral examinations in the subjects of Dental and Oral Surgery, Pathology, and Mechanics. The candidate will be tested in the Treatment of Dental Diseases, in Operative Dentistry, the Administration of Anæsthetics, Orthodontics, and in Prosthetic and Mechanical Dentistry. Candidates who claim exemption from the First Dental Examination on the ground of having passed the First and Second Triple Qualification Examinations or other recognised examinations will, before being admitted to the Second Dental Examination, be required to pay the total fee of £15 15s. payable for the dental diploma. Candidates applying for copies of Regulations should state date of registration as a dental student. Fees and schedules must be lodged with the Clerk not later than one week before the examination.

Separate Regulations are issued for candidates registered as Dental Students after Jan. 1st, 1923, for whom there is a much more extended course.

Higher Dental Diploma.—The College grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification. Every candidate for the Higher Dental Diploma shall produce evidence that he has been engaged in the study or practice of his profession as a Registered Dentist for at least one year subsequent to his having obtained the Licence in Dental Surgery of the College, or a Licence or Qualification in Dental Surgery specially recognised by the College. Particulars as to the examinations can be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, 49, Lauriston-place, Edinburgh. The fee payable by Licentiates of the College is £15 15s. For all other candidates £21. A fee of £10 10s. is retained for examination expenses in the case of referred candidates.

The examination embraces the following branches of Dental Science and practice: Dental Surgery, Anatomy, Pathology and Bacteriology, Prosthesis, Anæsthesia, and Dental Radiology. The examination will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical; and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow. Candidates applying for Regulations should state date of registration as a dental student.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Candidates for the licence in Dental Surgery are required to pass three professional examinations, and to produce certificates of having, subsequently to registration as a Dental Student, passed the examination in Biology, and attended courses of instruction in the following subjects at a recognised school of medicine: (a) Human anatomy, with dissections and demonstrations, for three academic terms. (b) Physiology, theoretical and practical, including Dental Physiology lectures for two academic terms. (c) Histology, for one academic term. (d) Chemistry and Physics as applied to Dentistry. For the second examination certificates must be produced of having attended, at an institution recognised by the College for the purpose, the following courses: (a) General Pathology (including Bacteriology) for three academic

terms. (b) Medicine for two academic terms. (c) Surgery for two academic terms. (d) The practice of a general hospital, with certified instruction in Clinical Medicine, Clinical Surgery, and Venereal Diseases, for three academic terms. For the final examination evidence must be produced of having been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the direction of the Superintendent of the Mechanical Department of a recognised Dental Hospital where the arrangements for teaching Mechanical Dentistry are satisfactory to the Council of the College; of having attended, at a recognised institution, courses of instruction in (a) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (b) Dental Mechanics. Lectures. Two courses. (c) Anæsthetics. One course. (d) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Twenty-four calendar months. (e) Dental Metallurgy. (f) A course of Radiology; of having been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a Dental Student; four years of professional study; and of being 21 years of age.

The subjects of the first examination are Anatomy, General, and Physiology and Histology. For the second examination (a) General Pathology (including Bacteriology), (b) Medicine and Surgery. For the Final Examination, General Surgery and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery, Dental Mechanics and Metallurgy, Anæsthetics, Orthodontia. Candidates must pass in all the subjects set at each examination which in the second and final parts will be partly *vivâ voce* and partly practical, and will include the examination of patients and the performance of dental operations. The total fee for the Diploma in Dental Surgery is 21 guineas.

UNIVERSITY OF BIRMINGHAM.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum: The "John Humphreys Odontological Museum." An Entrance Exhibition, value £37 10s., is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—

1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees. 3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. A. In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (a) Elementary Biology and Organic Chemistry, (b) Anatomy and Practical Anatomy, and (c) Physiology and Practical Physiology. B. That he has passed the class examinations in: (d) One Special Course of Lectures on Medicine, (e) One Special Course of Lectures on Surgery, and (f) Pathology and Bacteriology. C. That he has attended courses and passed the class examinations in: (g) Dental Histology and Patho-Histology, (h) Comparative Dental

Anatomy, and (k) Dental Surgery and Prosthetic Dentistry. D. That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes C and D. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work, and investigations in some subject connected with Dentistry, which theses shall be submitted to examiners to be nominated by the Dental Advisory Board.

UNIVERSITY OF BRISTOL.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than four years after passing the first examination in the subjects of Chemistry and Physics, of which three shall have been passed in the University. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Biology, and the curriculum extends over one year.* The Third Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for three years an approved pupillage in Dental Mechanics.† The Second Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall have passed an entrance examination satisfactory to the University before being admitted to any professional examination; the curriculum extends over four years from the date of passing a preliminary science examination in Chemistry and Physics. A three years' pupillage in Mechanical Dentistry is required‡ and four examinations must be passed, the subjects of which agree with those of the B.D.S. Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

UNIVERSITY OF DURHAM.—Every Dental student must, at the commencement of his studentship, be registered in the manner and under the conditions prescribed for Medical students.

Licence in Dental Surgery: The first examination consists of three parts, which may be passed separately. Part 1, Organic Chemistry. Part 2, Biology. Part 3, Theoretical Dental Mechanics, Dental Metallurgy (Theoretical and Practical). Second Examination: Anatomy, Physiology (including Biochemistry and Biophysics), Dental Anatomy and Dental Histology. Third Examination: Pathology and Bacteriology, Practical Dental Mechanics, Dental Materia Medica and Therapeutics. Final Examination: Medicine, Surgery, Dental Surgery and Pathology, Orthodontics, Operative Dental Surgery, and Dental Prosthetics, and Anæsthetics.

* Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

† This pupillage must be taken either in the University laboratories or those of some institution recognised for the purpose by the University.

A candidate before presenting himself for examination is required to furnish certificates of instruction in the required subjects, attended after registration as a dental student at recognised Colleges or Schools.

Degree of Bachelor of Dental Surgery (B.D.S.).—(a) For students taking their complete course of instruction in the University. Such students must pass the same matriculation tests as medical students, and the same pre-registration examination in Inorganic Chemistry and Physics. After registration students must spend five years in the University, on attendance on such subjects as Senate, on the recommendation of the Board of the Faculty of Medicine, may from time to time determine. They must attend the practice of the Newcastle-upon-Tyne Dental Hospital for not less than two and a half years. Six months of this time must be devoted to the study of the higher branches of dental science. There are four examinations.

The subjects of the *first* examination are Biology, Organic Chemistry, and Dental Mechanics and Metallurgy.

The subjects of the *second* examination are Anatomy, Physiology, Dental Anatomy and Histology.

The subjects of the *third* examination are Pathology and Bacteriology, Dental Materia Medica and Therapeutics, and Practical Dental Mechanics.

The subjects of the *final* examination are Medicine, Surgery, Dental Surgery and Pathology, and Orthodontia and Operative Dental Surgery. In this subject knowledge of a much higher standard, and more advanced practical work, is required than for the Licence in Dental Surgery.

(b) For candidates possessing a Licence in Dental Surgery of a British University. Candidates must study for at least one year in the University. During such year they must (a) attend a course of instruction in Pathology and Bacteriology, and (b) spend at least six months in the Newcastle-upon-Tyne Dental Hospital in the study and practice of the higher branches of dental science. They must also pass the third and final examinations for the degree of Bachelor of Dental Surgery.

*Degree of Master of Dental Surgery (M.D.S.).—*Every candidate for this degree must be a Bachelor of Dental Surgery of the University of not less than two years' standing, and present an essay embodying original work and research in some subject connected with dentistry. They must also perform to the satisfaction of the examiners a piece of special dental work demanding a high degree of skill and experience.

The examinations are held concurrently with the medical examinations, and the fees payable by candidates are as follow:—For the Licence in Dental Surgery: First, Second, and Third Examinations, each £3 10s.; Final Examination, £5; for Licence, £3; total, £18 10s. For the Bachelor of Dental Surgery: First, Second, and Third Examinations, each £5; Final Examination, £8; for the degree, £6 16s.; total, £29 16s. For the Master in Dental Surgery: examination, £5; degree fee, £6 6s. The practical examinations in dentistry are conducted at the Newcastle Dental Hospital.

UNIVERSITY OF LEEDS.—The degrees in Dental Surgery are Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.). All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the Matriculation Examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the University subsequently to the date of passing Parts I. and II. of the First Examination, and to have completed such period of pupillage or hospital attendance, or both, as may be prescribed by the regulations of the University. No candidate will be admitted to the degree who has not attained the age of 21 years on the day of graduation. The Diploma in Dental Surgery (L.D.S.) is awarded to successful candidates after attendance on approved courses extending over not

less than four years. The curriculum for the Diploma now includes the study of Biology for the First Examination. The classes in the Department of Dentistry begin on Oct. 1st. The instruction in the Preliminary subjects of Chemistry, Physics, and Biology are given in the main buildings of the University. The classes in the other subjects and the systematic courses in Dental subjects are held in the School of Medicine of the University in Thoresby-place. The clinical instruction is given in the Dental Hospital at the Leeds General Infirmary. Applications for the prospectus should be made to the Academic Sub-Dean of the Faculty of Medicine.

UNIVERSITY OF LIVERPOOL.—The University grants a Licence in Dental Surgery (L.D.S.) and degrees in Dental Surgery (B.D.S. and M.D.S.). The management of the curriculum (lectures, practical and clinical) is in the hands of the University Board of Dental Studies. The courses of systematic instruction are given in the main University buildings, and those in Dental Mechanics, Operative Dental Surgery, &c., are given in the University School Extension (opened 1922), adjoining the Dental Hospital, the laboratory of which is in charge of a skilled dental mechanic under the supervision of the Director of Dental Education. The clinical instruction is given in the Dental Hospital. Students can take the whole curriculum, including Dental Mechanics, at the University School of Dental Surgery. The times of the lectures at the University are arranged to meet the convenience of students, thus allowing the maximum time for attendance upon Dental Hospital practice. Fees: The fees for the complete courses, including Pupillage and Hospital Practice, are as follows: Degree of B.D.S., £250; M.D.S. (by research, £32; by examination, £27); L.D.S. (Liverpool), £198. Further information may be had from the Director of Dental Education, Prof. W. H. Gilmour.

In order to be admitted to the Bachelor's Degree in Dental Surgery a student must normally, after registration as an Internal Student, have—(1) Attended prescribed courses of study for five years at one or more Schools of the University. (2) Passed the following examinations:—(a) First Examination: *Part A*: (i.) Chemistry, (ii.) Physics, (iii.) Biology (Zoology and Botany); *Part B*: (iv.) Dental Metallurgy. Candidates may take Parts A and B separately. (b) Second Examination: *Part A* (i.) Anatomy, (ii.) Dental Anatomy, Dental Physiology, and Dental Histology; *Part B*: (iii.) Physiology; *Part C*: (iv.) Dental Mechanics. Candidates may take Part A separately but must take Parts B and C together. Third Examination: *Part A*: (i.) Elementary Bacteriology, (ii.) Clinical Chemistry, (iii.) General Pathology; *Part B*: (iv.) Dental Materia Medica, (v.) Dental Mechanics and Dental Prosthetics. Candidates may take Parts A and B separately. Students who have received not less than two years' instruction in Dental Mechanics previous to Nov. 30th, 1922, with a Dentist registered under the provisions of the Dentists Act (1921) and who have passed a recognised examination in preliminary education may, on application, be registered as students for the Licence under certain conditions.

UNIVERSITY OF LONDON.—The curriculum for the degree of Bachelor of Dental Surgery covers five years from Matriculation. The Regulations for Internal and External Students may be obtained post-free on application to the Principal Officer, at the University.

UNIVERSITY OF MANCHESTER.—In the University of Manchester the Dental Department forms an integral part of the Faculty of Medicine. This contains a series of laboratories, lecture rooms, and museums which will bear comparison with those of any other school in the kingdom, and the fullest opportunities for study are offered to students preparing for any of the professional examinations. Instruction adapted to the requirements of students preparing for the

B.D.S. Degree and the Dental Diplomas of the University, the Royal College of Surgeons of England, and of other licensing bodies is given throughout the session both at the University and at the Dental Hospital of Manchester adjoining the University. The required general hospital practice is taken at the Manchester Royal Infirmary. Women students are admitted to the classes in the Dental Department, and for them common rooms are provided. The composition fee for candidates for the University degree of Bachelor of Dental Surgery is 9½ guineas, payable in three equal yearly instalments. The composition fee for candidates for the University Diploma in Dentistry is 8½ guineas, payable in three equal yearly instalments. The composition fee for candidates for the L.D.S. of England is 9½ guineas, payable in three equal yearly instalments. Students who have already served their apprenticeship with a private practitioner, and who propose to complete the final portion of their attendance at the University and at an approved dental hospital, will be required to pay the composition fee in two equal instalments at the commencement of the first and second years of studentship. The composition fee does not include the hospital fees, the examination fees, nor the fee for the conferment of the degree or the diploma.

UNIVERSITY OF SHEFFIELD.—*Degree of Bachelor of Dental Surgery.*—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequent to matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year after matriculation and the passing of the further examination in Chemistry and Physics. Second Examination: The subjects of the examination are Anatomy, Physiology, Dental Anatomy, Physiology and Histology; Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are: Part I., Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including *Materia Medica* and Therapeutics. Candidates for Part II. must have completed five and a half years of professional study.

Degree of Master of Dental Surgery.—Candidates must have passed the examination for the degree of B.D.S. at least one year previously and before admission to the examination must have held for not less than six months a dental appointment in a hospital affording full opportunity for the study of Dental Surgery. Candidates shall not be required to but may present a thesis embodying observations in some subject approved by the Faculty and a candidate whose thesis is of exceptional merit may be exempted from any part of the examination.

Diploma of Licentiate in Dental Surgery.—A candidate must have attained the age of 21 years on the day upon which he is to receive the diploma, and have pursued the courses of study required by the University regulations during a period of not less than four years subsequently to passing the preliminary examination and the passing of the further examination in Chemistry and Physics. Two years must be passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year. Second Examination: The subjects of the examination are Anatomy and Physiology, Dental Anatomy and Physiology, Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are: Part I., Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including *Materia Medica* and Therapeutics. Candidates for Part II. must have completed the fourth year of professional study.

The Dental Composition Fee is £25 for each year of the course. In addition a fee of £50 is payable each year the student receives instruction in Mechanical Dentistry in the Dental Department.

QUEEN'S UNIVERSITY OF BELFAST.—The following degrees and diplomas are now conferred: Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

The TEACHING INSTITUTIONS will be summarised in the sequel.

(To be continued.)

Special Articles.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 403.)

EVIDENCE OF NURSING AND OTHER WOMEN'S ORGANISATIONS.

Queen Victoria's Jubilee Institute for Nurses.

(App. LXXII. and Q. 19400-19582.)

THIS evidence was submitted by Miss Peterkin, Mrs. Bruce Richmond, and Major H. F. Cadell. The Institute was incorporated by Royal Charter in 1889 with the object of training and providing nurses for work among the sick poor in their own homes. The principal functions of the Institute are the organisation of local nursing associations, the selection, training, and supply of nurses, and the supervision of their work while in the service of the local associations. The conditions for affiliation of nursing associations are mainly (1) that the work should be carried out under the direction of the medical practitioners; (2) that it should be inspected periodically from the Institute by a nursing expert; (3) that it should be unsectarian; (4) that the nurses' services should be primarily for those unable to employ a private nurse, and that the necessitous poor should be nursed free.

The cost of domiciliary visits varies somewhat widely, but the average rate of payment works out at 1s. 4d. Arrangements which have been made with many approved societies have been of two kinds—

Those in the first group make payment at the rate of 1s. 4d. a visit for the first 30 visits and then at the rate of not more than 5s. a week; those in the second at the rate of 1s. a visit, the Nursing Association collecting from the patient, if it wishes to do so, the additional 4d. a visit which makes up the average cost. Payment for the nursing of chronic cases is not made by those in the second group; both make a payment of 5s. for a nurse's attendance at an operation.

The contention of the Council of this Institute was that there is in existence an organised national service capable of covering the whole country and it urged that nursing should be provided for all insured persons. It was thought that such a service could be provided at a capitation fee of 1s. per insured person.

Asked whether, if such a service were made available, there would be much point in having a nursing association and a local authority supervising it, the witnesses deprecated the employment of nurses by the local authority and urged that the work should be done through the existing associations; they desired to make no suggestions as to who should administer it on the insurance side. The reason why, up to the present, nursing had not been greatly in favour as an additional benefit was partly due to the system of payment by visit and partly due to the

too-sure feeling that nursing arrangements were already freely available to insured and uninsured alike. The witnesses did not think that imposing a charge on National Health Insurance funds would injure the flow of voluntary subscriptions, but such a charge would entitle insured persons to priority of service.

In the Scottish part of this evidence it was stated that 80 per cent. of the homes of the people are quite suitable for the nursing care of all illnesses excepting only those requiring major surgical operations, and that while there are some rural areas still unnursed, the greatest need is for an expansion of the existing service in industrial centres, which it would not be difficult to arrange.

College of Nursing.

(App. LXXIII. and Q. 19583-19265.)

The College of Nursing has a membership of over 23,000 trained nurses, and is the largest organisation of trained nurses in the kingdom. Miss J. P. Watt, Miss G. Bremner, and Miss H. Viney gave evidence. The Council of the College recommend: (1) The provision of a statutory nursing benefit complementary to medical benefit from National Health Insurance funds; (2) that the staff employed for visiting care be fully qualified general-trained nurses with additional district training; and (3) that the visiting nursing care of the insured should be co-ordinated with other public nursing services, and that where resident care is required, the services of private nurses be utilised. They pointed out that the importance of trained domiciliary nursing has been much stimulated by the statement in 1914 of the then Prime Minister that any system of doctoring was hopelessly inefficient which was not supplemented by a good system of nursing. Notwithstanding this, nursing was still left very largely to voluntary enterprise. It was suggested that the Council's proposed scheme should be financed by a capitation payment of 1s. per insured person, with supplemental grants towards the cost of training and (experimentally) for the maintenance of a limited residential nursing service.

On the question of free choice of nurse the witnesses said that there was no analogy between the profession of nurse and panel doctor. Free choice of nurse is not feasible for economic reasons; also it was pointed out that a person going into a nursing home or a hospital cannot have choice of nurse. The witnesses thought that, amongst other things, a nursing service would bring home to the people the general benefit under the Act, because they would get a larger amount of individual attention.

(Q. 19596.) For example, you get a case of an abscess; it does not take the doctor very long to open it if you have a local anæsthetic; but it does take a nurse many days with dressings to get it healed. The same applies to pneumonia, where a doctor's visits would be about a quarter of an hour, whereas the nurse would spend nearly two hours, coming twice a day and perhaps a third time.

The witnesses estimated that 3 per cent. was the minimum number of insured persons requiring nursing and that this would increase as the value of the service became known.

(Q. 19595.) Would you agree that a nurse should be provided to attend upon an insured person only on the recommendation of the doctor in charge of the case?—It is an established practice now in district nursing that the people are at liberty to requisition the service, and after paying the first visit (unless it be a very trivial matter) the nurse arranges for or tells the people to call the doctor, and thereafter the doctor and nurse continue the treatment together.

It was thought that there was an adequate supply of trained nurses to meet the present needs of the insured population, and that the service would rapidly expand with improved conditions.

(Q. 19598.) The College wants an inclusive minimum salary of £250 a year, with allowances, as a living wage for these women; that would make the service attractive to them. The extra factors we have to consider in the district service work are the wear and tear of clothes, and the struggling against all weathers.

* References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

A nursing service should be a good business proposition and should progressively reduce sickness benefit claims. Its business value has been recognised by the Metropolitan Life Assurance Company of New York, who, last year, spent \$500,000 on nursing.

Incorporated Midwives' Institute; Scottish Midwives' Association.

(App. LXXIV. and LXXV. and Q. 19626-19793.)

Evidence was given by Miss Doubleday, Miss M. Gilligan, and Miss J. C. Barker. These witnesses indicated certain delays and other points of criticism of the administration of maternity benefit and the way in which these objections should be met. They urged that in addition to the cash payment, maternity benefit should include antenatal treatment. They also recommended that sick pay should be given for four weeks after the confinement both to the woman who is the wife of an insured person, and to the woman who is herself an insured person.

The Scottish evidence included a complaint that many general practitioners who had given up their poorer class midwifery practice were now resuming it, but employing untrained women. The Midwives' Association protest that this imperils the livelihood of their members and was a positive danger to infant life. While recognising that it was a serious offence to "cover" an unqualified woman, they said that none the less this was done.

(Q. 19664.) You would make the benefit available only if the labour has been conducted by a medical practitioner or a certified midwife?—Unless in a genuine emergency. We always allow for that.

With regard to the question whether the cash payment of maternity benefit was abused, the witnesses said that the mother was the right person to have it, although, in fact, it was sometimes misapplied.

(Q. 19652.) I do not say that the money is abused exactly. The position is this, that if they are living on the dole, as a very large number in Glasgow are just now, they are inclined to get a little bit behind with their rent, and they will say: "We will make that right when we get our maternity benefit," and it goes to the rent, or some necessary purpose, instead of to the midwife.

As regards antenatal treatment, the witnesses were asked whether this was not already given as part of medical benefit by the doctor, and they replied that a midwife undertakes her own antenatal work and advises medical supervision when it is necessary. In the case of a woman who is the wife of an insured man she is not entitled to receive medical benefit by the doctor.

The insistence of the witnesses on the fact that both antenatal and postnatal treatment so far as medical intervention was necessary called for specialist services led to the following:—

(Q. 19688-19689.) The British Medical Association have been here and have urged that every medical practitioner should, if he thinks fit, have a right to place his name on the midwifery panel. Are we to say if we adopted that recommendation we should be making a grave mistake?—I would say a very grave mistake.

You are prepared to put your opinion against that of the British Medical Association?—Yes.

(Q. 19697-19698-19699.) Is there anything left that the general practitioner can do with competence?—Yes, we are all prepared to agree with that.

We should be interested to hear it. So many people have told us there are so many things the general practitioner cannot do?—The general practitioner does deal with a normal amount of work connected with midwifery, all minor things, but I think everybody agrees that midwifery, directly it becomes abnormal at least, is a specialised subject, and they probably have not had either the time or the opportunity to concentrate upon that particular branch of the work.

National Union of Societies for Equal Citizenship.

(App. XCIX. and Q. 22975-23024.)

This Union, represented by Mrs. Hubback, is of opinion that no health insurance scheme is worthy of being called national if wives and children of the insured are excluded. They recommend the payment of allowances for the wives and children while the

husband or father is unemployed owing to ill-health, the extension of medical benefit to dependants of insured persons, and the admission to voluntary insurance, after marriage, of women who have been insured workers.

Industrial Women's Organisations.

(App. C. and Q. 23025-23208.)

Dr. Marion Phillips, D.Sc., appeared for the Standing Joint Committee, which represents the whole of the organised working women of the country, whether in the political or industrial Labour movement or in coöperative organisations.

The Committee recommends extension of medical benefit to dependants, the raising of the income limit for non-manual workers from £250 to £350, and the extension of the scope of medical benefit to include every form of specialist service. The Committee further urges the adoption of the proposals of the Maternity Convention held at Washington in 1919, including the provision of adequate maintenance for mother and child.

(App. C. 27.) Such women should have the right to leave their employment six weeks before the expected birth of a child, and not be permitted to return until six weeks after, and the allowance should continue throughout the period.

The payment of what the Committee called Washington benefit—£1 a week for 12 weeks—would involve a net charge of about £1,000,000 per annum. The Committee suggests that the administration of the maternity and Washington benefits should be in the hands of the local maternity and child welfare committees. Dr. Phillips said that they were not prepared for any increase in the contributions of working women towards the cost of the new and increased benefits which were recommended. As to the panel system the witness said that it has worked fairly well, but there is a strong tendency towards an increase in the number of salaried full-time medical officers, and that it was a tendency to which the Committee saw no objection.

Amongst other points in the evidence was a suggestion that women should have a clear and full statement of their rights to sickness benefit in the antenatal period, and a statement that the witness thought that the objections of the British Medical Association to clinics was to some of the present uncomfortable clinics, where the patient has to wait for hours and get a very hurried and poor service very often in the end, and not to specialist clinics. Clinics should be supplemental to domiciliary treatment and not a substitute for it.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Sterilisation of the Currency.

THE Academy of Medicine recently instructed a committee to inquire into the question of sterilising money and banknotes. Dr. Jules Renault, reporting the conclusions of this body, pointed out that sterilisation of money, as of all objects exposed to dirt, was theoretically desirable but at present impracticable. Fortunately, coins and notes, even the dirtiest, rarely carry pathogenic organisms; silver and bronze, indeed, have a considerable bactericidal action. Dr. Renault's researches showed that notes, if not sterile, are yet generally free from pathogenic organisms, a state of affairs probably due to the oxidation permitted by the porosity of the paper.

Alcoholism and Tuberculosis.

It has been stated that alcoholism favours tuberculosis. Dr. E. Arnould has recently studied the published statistics of this subject and concludes that more than half the fatal cases of tuberculosis in most countries occur in that section of the populace which, by reason of age, includes the fewest alcoholics. The incidence of alcoholism is always considerable in

men and women between 30 and 60 years of age, although varying in different countries; the incidence of tuberculosis, on the other hand, is always low at this age and is fairly constant in all lands. In England and Germany statistics for the last 30 years show that the consumption of alcohol per head has not diminished, while the mortality from tuberculous disease has gone down 50 per cent. English statistics from 1890-1912 show no correspondence whatever between the alcoholic mortality and the tuberculosis mortality, either for any period or for any class or profession. In France the figures show that the consumption of alcohol is sometimes a little higher in rural districts than in towns and sometimes a little lower, while the tuberculosis mortality of the country is always lower than that of towns. There seems to be no statistical correspondence between the frequency of alcoholism and that of tuberculosis.

Mental Disease Among Soldiers.

Médecin Principal (Colonel) P. M. V. Chavigny, discussing¹ mental disease in the French Army, has given it as his opinion that in peace time there is no special form of mental disease peculiar to the army, but that the cases seen by the army specialist differ completely from those that come before the asylum physician. He makes the following points. In the first place military cases are generally seen quite early, and generally, also, they are so slight that they would have escaped notice in civil life, but the military environment, in which eccentricities are seen under a magnifying glass, makes the symptoms conspicuous. Slight as they are, they are of great importance, for their consequences may be serious to the patient in the military punishments which may mistakenly occur. Colonel Chavigny instances the stupid but well-to-do young man, who moves from one of his houses to another because, he alleges, he is bored everywhere. No one bothers about this vagary of his while he is a civilian, but if he acts so in the army he has become a deserter, with the gravest penalties due from him. In France every man is drafted into the army and must be utilised somewhere, if that is possible, or man-power is wasted. If he is not fit for the fighting line, a recent decree permits his being drafted into the auxiliary services where some occupation more suited to his intelligence may be found for him. After classifying these mildly insane cases, Colonel Chavigny advises that great pains should be taken to distinguish them from the merely idle or incompetent, but avoids the practical difficulty of suggesting the methods of diagnosis, and recommends great caution in classing any as malingerers before they have had a week's observation ("this prevents regrets"). He thinks the medical officer who will treat these cases successfully must be a good clinician, must seek to sympathise with the difficulties of his patients and desire to help them, must not judge their mental processes by his own high standard, nor must he think them cured when they are only silenced. "It is easy enough to empty one's wards, but that is not the aim." He also notes the difficulty of explaining these cases to a court-martial, which does not understand them, nor does it trust the expert. His article will well repay study.

Unfounded Protests.

Quite recently some 200 patients from the Municipal Tuberculosis Sanatorium at Bicêtre, Paris, formed a silent procession through the streets to protest against the bad quality and insufficiency of the food served to them; at their head was borne a placard bearing the inscription: "Defence committee for the interests of the tuberculous patients of Bicêtre." One well-known Paris journal decided to investigate the matter, and sent a representation to visit the institution at the invitation of the director of public relief. The representative came away full of praise for what he saw, and cheered by the reports several patients gave him of their well-being. No further protests, I understand, have been made.

International Anti-Tuberculosis Union.

The Executive Committee and the Council of the International Union against Tuberculosis at the last meeting adopted some interesting resolutions, to be presented to the next international conference in 1926. It was resolved that the following questions should be taken for discussion: (a) The part played by contagion in tuberculosis among adults (clinical subject); (b) anatomical structure of tubercle from histogenesis to cavity (biological subject); (c) tuberculosis and milk (social subject). Thursday, Sept. 30th, Friday, Oct. 1st, and Saturday, Oct. 2nd, 1926, are proposed for the next international conference at Washington, Dr. Theobald Smith, President of the American Association, to preside. A further resolution called attention to the need to intensify the organisation of occupational therapy, and the investigation of the relations between tuberculosis and school management.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Irish Free State and the Medical Register.

Up to the moment of writing there has been no change in the position as regards the Medical Register, and the Government shows so far no sign of yielding to the pressure of public opinion in favour of maintaining the present arrangements. The newspapers have published many protests, not only from medical teachers and members of the medical profession, but from laymen who see the dangers of the policy adopted by the Government. Almost the entire bulk of the correspondence, and of the numerous interviews given to press representatives, has been in favour of continuing the control of the profession in the Free State by the General Council. One or two individual medical men have written in the contrary spirit, and a document in favour of the change has been published by a standing committee of University College, Galway, appointed to consider all matters of a medical nature affecting the College. They say:—

"Control of Irish medical matters has been in the hands of the British Medical Council, on which Ireland has a minority representation. That the British Medical Council have worked in the interests of the profession is not disputed. The time has now arrived, however, when an Irish nation must control its own affairs, and this applies to medicine as to other matters. The action of the Government is the logical result of our present national status. The hardships which will accrue to Irish graduates when Irish medical men take charge of their own affairs has been unduly stressed. Australian and Canadian graduates may, without much difficulty, practise in England. We believe that the interests of young Irish medical men can also be protected."

This has been the only statement from any medical body in favour of the attitude of the Government. It has received two answers, written from very different angles. The first is given by "a prominent Dublin surgeon," who prefers to remain anonymous. He deals in some detail with the technical and legal difficulties involved in obtaining reciprocity or Colonial status. As regards reciprocity, the Dublin surgeon points out that if reciprocity be established, the mere fact of establishing such a relationship with the General Medical Council places the medical schools of Ireland again under its complete control.

As regards the technical mode of obtaining registrations on the Colonial List, the Dublin surgeon quotes the Medical Act of 1886 to show that—

"the applicant must prove, to the satisfaction of the Registrar to the General Medical Council, that the diploma or diplomas through which he wishes to be placed on the Colonial Register were granted to him at a time when he was not domiciled in the United Kingdom, or in the course of a period of not less than five years, during the whole of which he resided outside the United Kingdom."

¹ Arch. de Médecine Militaires, May, 1925, p. 563.

He sums up his case as follows:—

"The Free State Government cannot obtain reciprocal arrangements with England as regards the Colonial Register unless (1) they desire to be recognised as a British possession; (2) they wish to have their medical men tried by a 'foreign' tribunal, on which they have no representation; (3) they are content to wait until five years (one and a half years more) have passed since the setting up of the Free State."

Senator Oliver Gogarty, F.R.C.S.I., in a letter to the daily press, furnishes another, if indirect, answer to the Galway statement. He suggests that it is in the mind of the Government to turn the College of Galway into an institution in which a medical education will be given in the Gaelic tongue. As such a project might be difficult to carry out while medical education is under the control of the General Council, the Government first decides to abolish that control. Strange as such a suggestion appears, Senator Gogarty appears to write in all seriousness.

The "prominent Dublin surgeon" has rendered a service in stressing the difficulties that lie in the way of obtaining any reciprocal registering arrangement with Great Britain. Many of those who wrote to the papers took for granted that reciprocal arrangements were impossible, and contented themselves with pointing out the evils of an entirely independent and separate Register. Later controversy has therefore tended to focus more and more on the relative advantages and disadvantages of the Colonial List. In this connexion a point of some importance has emerged, in that it appears that the General Medical Council cannot register, either in the Colonial List or anywhere else, a Diploma in Public Health granted outside the United Kingdom.

The President and Vice-President of the Executive Council (Mr. Cosgrave and Mr. O'Higgins) have defended their position on the platform, the basis of their arguments being that the Irish nation must control its own affairs, and summing up the present problem as "a question as to the particular place on the Register on which the names of Free State doctors will appear." Two temporising measures have been suggested in the public press as a way out of the impasse: the first is that the Government should postpone the operation of its decision for a year by passing another temporary Act, concrete and definite arrangements for reciprocity being made in the available period; and the second, emanating from the Galway College, is to the effect that a provisional medical council be appointed, consisting of representatives of licensing bodies in the Free State, and that this body should discuss with the General Medical Council the future relations.

The President and Council of the Royal College of Surgeons in Ireland have summoned a public meeting of the profession for Tuesday, Sept. 8th, at 4.30 P.M., to consider the whole situation. The Council has passed a resolution approving of the attitude taken in the controversy by the President, Mr. R. C. B. Maunsell, and expressing its confidence in his judgment. It is wisely announced that no political discussion will be permitted at the meeting, which is for the education of the public on the questions at issue.

Poor-law Reform in Dublin.

The Commissioners in charge of the affairs of the Dublin Poor-law Union have under consideration a comprehensive scheme for the reform of Poor-law administration in Dublin. They hope to separate the several classes of inmates at present in the union, and to provide suitable treatment for each group. It is understood that the St. Vincent de Paul Society, a very powerful charitable organisation, is prepared to play an important part in assisting the Commissioners towards this end. The present intention is that the society shall take over a portion of the North Dublin Union premises for the reception of all able-bodied destitute classes with a view to reforming this particular class rather than housing them. With regard to the aged people, they will be handed over to some religious order and housed outside the

union. It is possible that the old age pensions will be given to many of these people. Special treatment is to be provided for mental cases in surroundings which will give them every possible chance of a recovery. There are at present 400 such cases in the wards of the union and they are neither segregated nor treated in accordance with modern methods. They will be placed under the care of specially trained sisters, and will be paid for on a capitation basis. Consumptives will be provided for on similar lines. If all the arrangements projected are carried out, the only classes that will be received in the Dublin Union premises will be those needing medical or surgical treatment, and the buildings will be turned into a modern hospital. The scheme, it is claimed, will make for proper supervision and correction of the "ne'er-do-well," better treatment for the casually destitute person, up-to-date assistance for the mentally affected, proper classification for consumptives, with suitable surroundings, the provision of a home for the reception and training of crippled, deformed, and mentally defective children.

Northern Ireland: Vital Statistics.

During the quarter ended June 30th, 7414 births were registered in the 27 superintendent registrar's districts in Northern Ireland, this number being equivalent to an annual birth-rate of 23.2 per 1000 of the estimated population. The corresponding birth-rate for England and Wales for this quarter was 19.4 per 1000 and for Scotland 22.9. The deaths registered during the quarter numbered 4913, representing an annual rate of 15.3 per 1000; the corresponding death-rate in England and Wales was 11.7 per 1000 and in Scotland 13.0 per 1000. The population of Northern Ireland in the middle of 1925 is estimated to be 1,281,000, inclusive of military.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEKS ENDED (1) AUGUST 15TH AND (2) AUGUST 22ND, 1925.

1. *Notifications.*—The following cases of infectious disease were notified during the week ended August 15th: Small-pox, 34; scarlet fever, 1400; diphtheria, 790; enteric fever, 89; pneumonia, 441; puerperal fever, 54; cerebro-spinal fever, 9; acute poliomyelitis, 10; acute polio-encephalitis, 1; encephalitis lethargica, 35; continued fever, 1; dysentery, 11; ophthalmia neonatorum, 118. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, 18 from measles, 13 from scarlet fever, 37 from whooping-cough, 23 from influenza, and 13 from diphtheria. There were 136 deaths of children under 2 years from diarrhoea and enteritis, as compared with 108, 101, 64, 50, and 44 in the preceding weeks. In London itself there were 2 deaths from diphtheria, 3 from whooping-cough, and 5 from influenza.

2. *Notifications.*—The following cases of infectious disease were notified during the week ended August 22nd: Small-pox, 50; scarlet fever, 1336; diphtheria, 711; enteric fever, 88; pneumonia, 440; puerperal fever, 38; cerebro-spinal fever, 5; acute poliomyelitis, 16; acute polio-encephalitis, 1; encephalitis lethargica, 44; continued fever, 1; trench fever, 1; dysentery, 8; ophthalmia neonatorum, 112. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 3 deaths from enteric fever, 31 from measles, 9 from scarlet fever, 44 from whooping-cough, 20 from influenza, and 20 from diphtheria. There were 177 deaths of children under 2 years from diarrhoea and enteritis, as compared with 136, 108, 101, 64, and 50 in the preceding weeks. In London itself there were 4 deaths from diphtheria, 8 from whooping-cough, and 2 from influenza.

Dr. J. A. Mitchell, Secretary for Health and Chief Health Officer of the Union of South Africa, is taking three months' vacation in order to represent the Union of South Africa at the Conference of Empire delegates at the Ministry of Health, to be held in connexion with the proposed International Sanitary Convention.

Correspondence.

"Audi alteram partem."

THE SUPPLY OF VACCINES TO PANEL PATIENTS.

To the Editor of THE LANCET.

SIR,—The letter of Dr. C. W. Cunningham in THE LANCET of August 22nd gives public expression to a question which I frequently hear asked by panel practitioners, and have wondered why more adequate arrangements are not made with pathologists for the supply of vaccines when required for panel patients.

In my work as pathologist I have not infrequently supplied either stock or autogenous vaccines for panel patients free of charge, for one or other of the following reasons. Either the case is so urgent that the clinical condition will not allow of the delay necessitated in obtaining official permission for the necessary vaccine preparation, or the panel practitioner obtains this help for his patients, which is not officially given; or when repayment is refused, as has happened, the pathologist has forgone remuneration for the work done on behalf of the panel service. I am sure my experience is not an isolated one. Most panel doctors are keen clinicians and want to give their patients not only the best therapeutic, but also prophylactic treatment, and are galled by the restrictions which limit adequate service being provided. The absence of these facilities for panel patients, which makes the occasional provision of gratuitous supplies necessary, introduces an obvious difficulty, for medical men hesitate or refuse to ask for the repetition of unremunerated assistance from colleagues except in very special circumstances, and therefore other cases are less adequately treated than might be.

It would not be difficult to arrange with the health insurance authorities for a standard rate for vaccines supplied for the treatment of panel patients and thus obviate such difficulties as your correspondent has encountered.—I am, Sir, yours faithfully,

E. CRONIN LOWE, M.B.E., M.B., B.S.

Southport, August 25th, 1925.

A PECULIAR SYMPTOM IN ENCEPHALITIS LETHARGICA.

To the Editor of THE LANCET.

SIR,—Since the mental sequelæ of encephalitis lethargica are attracting much attention at the present time, the following may be of interest to your readers.

Mrs. E. C., aged 25, married, a machinist by occupation, complained of insomnia of a fortnight's duration. She felt sleepy during the day and restless at night. On asking her to walk on tiptoe she staggered and said her "legs gave way." She had diplopia and consequently was unable to do her work. She complained of sore-throat and her voice was hoarse. Fine tremors of the hand could be detected on careful observation. The most interesting symptom consisted in the fact that she avoided travelling by omnibus and tramcar as it made her worse and uncomfortable, and consequently preferred to walk accompanied by her mother even a fairly long distance. Her pulse and temperature were normal.

It is difficult for me to offer a satisfactory explanation of the above symptoms, but no doubt neurologists will be able to elucidate them.

I am, Sir, yours faithfully,

London, August 25th, 1925.

J. D. DHUV.

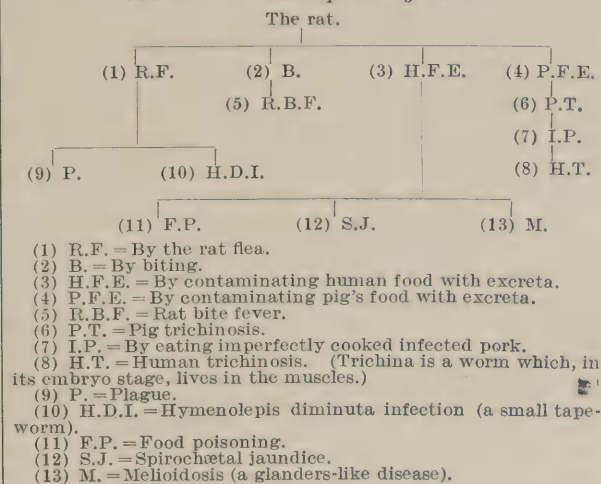
RAT-BORNE DISEASES.

To the Editor of THE LANCET.

SIR,—The Department of Agriculture S.S. and F.M.S. recently prepared an exhibit showing the damage done by rats to food and tropical produce for an agricultural exhibition held in Kuala Lumpur.

The Institute for Medical Research was asked to collaborate by arranging a demonstration of the dangers of rats to public health, and the attached table of diseases of rats, which are communicable to man, was drawn up for the exhibit. As the table may be useful for other exhibitions and for propaganda during "rat weeks" I am forwarding a copy for publication.

Human Diseases Spread by Rats.



I am, Sir, yours faithfully,

A. NEAVE KINGSBURY,
Pathologist, Institute for Medical Research,
Kuala Lumpur, Federated Malay States.

July 18th, 1925.

ASCARIS LUMBRICOIDES AND PIGS.

To the Editor of THE LANCET.

SIR,—I was very interested in the annotation in your issue for July 18th, *Ascaris lumbricoides* in Hertfordshire. Here in Port Said, for some reason not hitherto explained, about 90 per cent. of the Egyptian population (Port Said, European 13,000, Egyptian 67,000) are infected with ascaris, and it has always been a puzzle why this should be so as the rest of Egypt does not show such a high percentage for ascaris (about 4 per cent.). Your annotation probably puts us on to the origin of the trouble—pigs. In Port Said pigs are bred for the crews of the passing ships. The result is a vast herd of pigs feeding on the town rubbish dump near the destructors and, I suppose, hence the ascaris. The water-supply at Port Said is one of the purest and best in the world and is quite above suspicion.

I am, Sir, yours faithfully,

H. E. S. STIVEN, M.D. Camb.,
Principal Medical Officer, Government Hospital,
Port Said, Egypt.
August 8th, 1925.

ALL SAINTS' HOSPITAL.

To the Editor of THE LANCET.

SIR,—May I draw your attention to the fact that in the Students' Number of THE LANCET there is no mention of this hospital among the supplementary hospitals giving courses of instruction.

Courses of instruction are given at the out-patient department, 49-57, Vauxhall Bridge-road, S.W. 1, on Monday, Wednesday, Thursday, and Saturday afternoons at 1.30, and on Monday, Wednesday, and Thursday evenings at 6.30; opportunities are afforded for the seeing of operations performed daily at the in-patient department at 91, Finchley-road, N.W. 8.

I am, Sir, yours faithfully,

ELIZABETH HART,
Assistant Secretary.

Vauxhall Bridge-road, S.W., August 29th, 1925.

Obituary.

JOHN FREDERICK GORDON DILL, O.B.E.,
M.D. CAMB., M.R.C.S. ENG., M.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE ROYAL SUSSEX COUNTY HOSPITAL.

WE announced last week the regretted death of Dr. J. F. Gordon Dill at the age of 66, which occurred at his residence in Hove on August 22nd.

Dr. Gordon Dill was the eldest son of the late Dr. Richard Dill, a well-known medical practitioner in Brighton and Hove, by his wife, the daughter of General Sir Charles Wale, K.C.B.—she only died in May last at the age of 101. Dr. Richard Dill had succeeded an uncle in practice at Brighton, thus making a long hereditary connexion.

John Gordon Dill was educated at Gonville and Caius College, Cambridge, and St. George's Hospital. At the University he graduated in honours in the Natural Science Tripos, and was well known also on the running-track and, perhaps especially, as a footballer under Association rules. He completed his medical education at St. George's Hospital, took the Cambridge M.B., and, after holding certain resident appointments, went to Paris to study under Charcot. At that time his inclination was towards entering into special practice in London, but on his return he decided to carry on his father's work at Brighton and Hove. Here he succeeded to and enlarged a prominent practice, while he was elected at the first opportunity upon the staff of the Royal Sussex County Hospital.

For the next 30 years Dill's name was associated with all medical movements in the town and county. He was at different times chairman of the Brighton Medical Association, president of the Sussex Medical Society, and physician to the Sussex Dental Hospital, as well as physician to the County Hospital, and in all his posts his wisely tolerant attitude, coupled with his energetic mind, made him early to see the places in which the organisation of the medical profession was weakest and enabled him to discern that the places were those in which the public interests had to be considered equally with those of the practitioner. He was an ardent champion of the right of the general practitioner to occupy an important place in all the national developments of medicine foreshadowed under the National Insurance scheme, while from his intimate acquaintance with hospital administration he could realise out of personal experience the fundamental troubles associated with the poverty of voluntary hospitals, the tragedy of bed shortage in the institutions coupled with their long waiting-lists, and the difficulties of dealing with hospital abuse—subjects upon all of which he wrote much and judiciously and on occasions spoke with great clearness. The concrete form which his energies finally took was the foundation of the Sussex Provident Scheme by which hospital benefits and additional medical services were to be brought economically within the reach of the proper subjects. This scheme, of which the full details have been published on several occasions in THE LANCET, gained in the end, and after some criticism, the approval of the medical profession in the county of its origin, and soon began to attract attention elsewhere. It was a scheme designed to supply medical service which should debar no one from obtaining every accepted means of diagnosis and treatment, the essential aim being to supply a service which the patient could afford and which at the same time brought a fair remuneration to the doctors. The scheme rolled nine co-operating general and special hospitals together on a uniform basis, urgent cases being admitted to the hospitals as already arranged for, while other cases requiring operation or consultation were placed upon waiting-lists, such patients, however, taking no precedence of urgency cases. The consultation fees were drawn from a pool formed by deducting a percentage of the moneys

allotted to each hospital, and it was Dill's hope that, if and when his scheme in Sussex could be proved successful, a similar plan would be applied to conditions ruling in other areas. His ideas took further practical shape in the foundation of the British Provident Association, when in 1921, with the assistance of Viscount Knutsford, Sir Arthur Stanley, Sir Alan Anderson, Lord Dawson, and Mr. McAdam Eccles, he set up the National Provident Scheme for hospital and additional services. This scheme, which during the intervening years has done excellent work and has developed into the British Provident Association as now known, owed its conception to his imaginative faculty. As secretary of the original scheme and of its permanent successor he gave of his time and energies without stint, and the results achieved are a proof of his sagacity as well as a justification of his enthusiasm for the welfare of his fellows. As far as Sussex is concerned, the last figures published showed that 26,500 members of the public were entitled to the benefits of the scheme, and that in 1924 over £5500 were paid through its channels to the hospitals for services rendered to the subscribers. It is understood that the figures for the first six months of the present year have an equally good or better promise.

In October last year Dill was compelled to undergo a serious operation from which at the time he made a successful recovery, but the relief proved only temporary, and the sad end was not unexpected by many of his friends.

Dr. Gordon Dill married Mary, daughter of the late Simon Martin, of the Indian Civil Service and son of the well-known consulting physician to the India Office, Sir Ronald Martin, by whom he had two sons. He leaves behind him the memory of an able and generous man whose talents as well as his personal charm had endeared him to a wide circle.

JAMES STEWART FOWLER, M.D., C.M.,
F.R.C.P. EDIN.

Dr. J. Stewart Fowler, physician to the Royal Hospital for Sick Children, Edinburgh, died on August 24th in Elie, Fifeshire, at the age of 55. By his untimely death Edinburgh in particular and the medical profession in general has lost a valuable member.

James Stewart Fowler was the son of Dr. James Stewart Fowler, of Georgetown, Demerara, and was educated at the Edinburgh Academy. He received his professional training at Edinburgh University, where he graduated M.B., C.M. in 1892, taking in the same year the English double qualification. As a student he had a distinguished medical career, gaining honours on graduation, along with the Allan Fellowship, the Gunning Victoria Scholarship, and the McCunn Scholarship. He was keenly interested in the Royal Medical Society of Edinburgh, of which he was a Fellow and past president. After the usual hospital appointments in Edinburgh he went abroad to study in Vienna, and in 1899 took the M.D. Edin., being awarded a gold medal for his thesis. In 1895 he became a member of the Royal College of Physicians of Edinburgh and two years later obtained the Fellowship of the College with which he has been so closely associated ever since. Dr. Fowler practised as a physician, and was a sound authority on the diseases of childhood. He was senior physician to the Royal Hospital for Sick Children and University lecturer in diseases of children at that hospital, physician to Chalmers Hospital, and honorary pediatrician to the Royal Maternity Hospital. Formerly he held posts as assistant physician to Leith Hospital and physician to the New Town Dispensary of Edinburgh. During the war he acted as temporary captain in the R.A.M.C., and was on active service with the forces in Salonica. In 1918 he was appointed secretary and registrar of the Royal College of Physicians of Edinburgh, which post he held up to the time of his death. He was a member of the Association of

Physicians of Great Britain and the Medico-Chirurgical Society and Pathological Club of Edinburgh, and took a great deal of interest in the proceedings of these societies.

Dr. Fowler made many valuable contributions to medical literature, and at the time of his death was joint editor of the *Edinburgh Medical Journal*. In 1899 he published, in joint authorship with Dr. G. Elder, "Diseases of Children: a Clinical Handbook," and in 1909 appeared his "Artificial Feeding of Infants." Both of these books have proved valuable works of reference. Among his contributions to various compilations and journals are the following: an article on Mumps in the *Encyclopædia Medica* (1901); *Diseases of the Genito-Urinary System* in Garrod, Batten, and Thursfield's *Diseases of Children*; *Splenic Anæmia of Infancy*, *Brit. Med. Jour.* (1902); *Epidemic Cerebro-Spinal Meningitis*, *Rev. Neurol. and Psychiatry* (1907); and, with Dr. Carnegie Dickson, *Tuberculous Sclerosis*, *Quart. Jour. Med.* (1910).

A colleague writes: "The unexpected suddenness of Dr. Fowler's death has come as a great shock to his many friends. Up till a few hours before the end he had been in his usual good health, and indeed on the morning of August 24th he had been on a boating expedition with his daughter and a friend. In the afternoon he felt ill, became unconscious, and passed away in the evening. As a skilled and sympathetic physician he was greatly loved, and his charm endeared him particularly to those very young children amongst whom he did the greater part of his work."

Dr. Fowler was married in 1902 to Edith, daughter of Mr. Philip Hudson, C.E., of Hyderabad, who predeceased him 11 months ago. He leaves one daughter.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. J. J. H. Rooney is placed on the Retd. List with the rank of Surg. Capt.

Surg. Comdrs. A. H. Joy to the *Pembroke* for R.N. Barracks, temp.; F. L. Smith to the *Furious*, on commg.; and S. F. Dudley to *Diomedes*, on recommg. (lent to N.Z. Division). Surg. Lt.-Comdr. L. W. Gommell to the *Comus*, on commg. Surg. Lts. E. B. Pollard to the *Columbine* for Port Edgar Base, temp.; S. Morrow to the *Furious*, on commg.; and S. G. Rainsford to *Pembroke* or R.N. Hospital, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

J. Stephen, late Temp. Surg., and Proby. Surg. Lt. A. S. Bradlaw to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. F. W. W. Dawson retires on ret. pay. Capt. R. P. Cormack is granted the temp. rank of Maj. whilst empld. as Dep. Asst. Dir. of Pathology. Capt. W. E. Tyndall relinquishes the temp. rank of Maj. on ceasing to be empld. as a Dep. Asst. Dir. of Pathology. Capt. D. C. Bowie is restd. to the Establt. Capt. G. C. Robinson is placed on the half-pay list on account of ill-health.

ARMY DENTAL CORPS.

Temp. Capt. A. S. Newton, Dental Surg., relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Qrmr. and Capt. F. C. Strike, having attained the age limit of liability to recall, ceases to belong to the T.A. Res. of Off., and retains his rank.

SUPPLEMENTARY RESERVE OF OFFICERS.

Capt. A. G. B. Duncan, late temp. Capt. R.A.M.C., to be Capt.

ROYAL AIR FORCE.

Flight Lt. D. G. Boddie is promoted to the rank of Squadron Leader.

Flight Lt. G. M. Mellor relinquishes his temporary commission on ceasing to be employed and is permitted to retain his rank.

Capt. A. B. H. Cole, Army Dental Corps, is granted a temporary commission as a Flight Lt. on attachment to the R.A.F. for a period of four years.

Flight Lt. J. Wren (Capt., Army Dental Corps) relinquishes his temporary commission on return to Army duty.

INDIA AND THE INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Cols. L. Hirsch (on account of ill-health), J. C. G. Kunhardt, and H. A. F. Knappton.

Capt. S. N. Hayes, Civil Surgeon, Dalhousie, is appointed Professor of Midwifery, King Edward Medical College, Lahore. Maj. E. W. O'G. Kirwin, Civil Surgeon, Murshidabad, is appointed to act as Superintendent, Central Medical Hospital, Berhampore, during the absence on deputation of Capt. J. E. Dhunjibhoy. Maj.-Gen. D. J. Collins, Deputy Director of Medical Services, Southern Command, officiates as Director of Medical Services in India, Army Headquarters, during the absence on leave of Maj.-Gen. O. L. Robinson. The services of Maj. J. A. S. Phillips, Assistant Director of Public Health (Malariology), United Provinces, are lent temporarily to the Government of Nepal for malaria work. Lt.-Col. Godfrey Tate, V.H.S., officiating Inspector-General of Civil Hospitals, Punjab, is appointed President of the Punjab Medical Council, vice Col. C. R. Bakhle, resigned.

The King has been pleased to give directions for the appointment of John Owen Shircore (Director of Medical and Sanitary Services) to be an Official Member of the Executive Council of the Tanganyika Territory.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—T. K. Clifford, Manchester; C. D. Cogswell, King's Coll. Hosp.; V. G. Crowley, Sydney; S. W. Cuff, St. Bart's Hosp.; A. L. Evans, London Hosp.; W. O. H. Evans, Bristol; T. H. Harrison, Sheffield; A. H. Henson, Charing Cross Hosp.; J. Herbert, Guy's Hosp.; E. P. Hyde, Manchester; A. B. Osbourne, St. Mary's Hosp.; W. Irving Pierce, Boston; F. Reynolds, Manchester; H. A. Sack, Middlesex Hosp.; G. H. Shanley, Durham; M. Schwartzman, Odessa and Middlesex Hosp.; and I. Waynik, Charing Cross Hosp.

Medicine.—C. D. Cogswell, King's Coll. Hosp.; W. Hinds, Durham; E. P. Hyde, Manchester; and M. V. Roberts, London Hosp.

Forensic Medicine.—O. Bastable, Leeds; E. P. Hyde, Manchester; E. J. Newman and M. V. Roberts, London Hosp.; and I. Waynik, Charing Cross Hosp.

Midwifery.—R. F. Ashkeny, Cambridge and London Hosp.; A. L. Evans, London Hosp.; W. Ivers, Manchester; E. H. Rampling, St. Thomas's Hosp.; M. V. Roberts, London Hosp.; and C. H. Spencer, Manchester.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: A. H. Henson, J. Herbert, W. Irving Pierce, A. B. Osbourne, and I. Waynik.

THE FELLOWSHIP OF MEDICINE.—The Fellowship of Medicine and Post-graduate Medical Association (1, Wimpole-street, W.) will provide an intensive course in general medicine, surgery, and the various special departments at the Westminster Hospital from Sept. 21st to Oct. 2nd from 10.30 A.M. to 5.30 P.M. each day. The fee for the course is 3 guineas or 2 guineas for either week. At the Infants Hospital a two weeks' comprehensive course dealing with the study of diseases of infants will be held from Sept. 7th. Three visits will be made to centres away from the hospital. The Seamen's Hospital will begin a five weeks' course in operative surgery from Sept. 7th. Classes will be held four times weekly, and the fee is fixed at £10 10s. In dermatology an afternoon course will be provided at Blackfriars Skin Hospital from Sept. 7th to 19th. A special demonstration of interesting cases will be given on Sept. 8th. The Royal Westminster Ophthalmic Hospital has arranged a three weeks' course from Sept. 7th. Clinical instruction will be given every afternoon, and special demonstrations three times weekly. From Sept. 21st to Oct. 3rd the Brompton Hospital provides a special course covering the various aspects of pulmonary disease by lecture, demonstration, &c. On four successive Wednesdays, beginning Sept. 23rd, Dr. C. B. Heald will give special demonstrations on treatment by electrotherapy at the Royal Free Hospital at 5.30 P.M., the course being designed for general practitioners. Full particulars and syllabuses of the courses, together with the Fellowship programme, may be obtained from the secretary.

BRITISH MOSQUITO CONTROL INSTITUTE.—The opening of the new house of this Institute on Hayling Island by Sir Ronald Ross on Monday last was a public recognition of the valuable work done by a non-professional worker. Mr. John F. Marshall, the founder of the Institute, has devoted himself to the investigation and elimination of the mosquito from Hayling Island. From this nursery originate nearly all the mosquitoes that torment our coast towns in the late summer, and the general public owes a considerable degree of increased comfort on holiday to the efforts of Mr. Marshall and his fellow workers. The fourth report of the Institute describes the work undertaken, at a cost of £180, to clear the numerous breeding-places of the salt-water mosquito, *Ochlerotatus detritus*, and the fresh-water larvæ of *O. rusticus* and *Theobaldia annulata*. A valuable auxiliary corps was found in the "mosquito control class" of local school-children, who were taught how to identify and collect specimens of mosquitoes and larvæ. Many breeding-places have been located by the children. The original local work extended so rapidly that Mr. Marshall determined to erect a special building for research into the problems of mosquito control, and to inaugurate a "British Mosquito Control Institute." Many distinguished scientists have become members of its council and the opening ceremony was attended by a large party from the British Association. The Institute contains a demonstration museum, laboratory, drawing and record offices, photographic rooms, and a mechanical workshop, in addition to the well-equipped research rooms. Sir Ronald Ross, in his speech, said that 30 years ago, when he started work on malaria and mosquitoes in India, there was not a single satisfactory book or article on the mosquito. Now there was much knowledge, but energy to act upon the knowledge was still needed to carry on the work begun in Ismailia, Panama, and the Malay States. The ultimate aim must be to control all the dangerous and unpleasant pests that affect man, his crops, and his herds. He urged a great increase in the amount of money devoted to research. Colonel James, representing the Ministry of Health, seconded the vote of thanks to Mr. Marshall proposed by Mr. Tate Ryan, President of the Zoological Section of the British Association. Colonel James said that the success of public health administration was very largely due to the voluntary assistance received from public-spirited persons, adding that the Ministry of Health would watch Mr. Marshall's work with keen and helpful interest.

ROYAL SANITARY INSTITUTE.—The autumn course of lectures and demonstrations for sanitary officers commences at the Institute on Wednesday, Sept. 23rd. The course comprises the subjects scheduled for the examinations of the Institute and the Sanitary Inspectors' Examination Board (formed by the Institute and other bodies). On Friday, Oct. 2nd, a course of systematic practical training in the inspection of meat at a cattle market, &c., will be opened for meat and food inspectors. A detailed programme of the courses and full particulars may be obtained from Mr. E. White Wallis, F.S.S., director and secretary of the Institute, 90, Buckingham Palace-road, London, S.W. 1.

INSANITY AND MENTAL DEFICIENCY IN SCOTLAND. The annual report of the Scottish Board of Control, which has just been issued, states that the number of insane and mentally defective persons under the Board's supervision on the first day of the present year was 20,850, of whom 18,398 were certified insane—almost exactly the same number as in the preceding year. Certified mental defectives have, however, increased from 2308 to 2452. The proportion of recoveries calculated on the admissions during the year was 33.4, which is 3.4 above the average of the previous five years. There was a substantial increase in the number of voluntary inmates. The Board express the hope that the contemplated scheme for the establishment of colonies for the adult mentally defective will reduce to a minimum the practice of placing of such patients in asylums.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 54 cases were considered and £663 was voted to 43 applicants. The following is a summary of the new cases relieved:—

M.R.C.S., L.R.C.P., 1893, aged 59. Married, six children, aged 5 to 18 years. Eldest tea-planting in Ceylon at Rs.400 a month. The rest live at home and attend school. Income from practice and panel dispensary about £230 per annum. Rent and rates £66 per annum. Applicant was taken suddenly ill in July and was operated on for gangrenous bladder. Nursing home fees were paid by his colleagues in the profession, but it was discovered that the wife and family were without means. The Fund sent £10 at once.

Widow, aged 58, of L.R.C.P. Edin. who was a ship's surgeon and died abroad in 1923. Applicant has managed to keep herself and invalid sister on the little money left and by the sale of trinkets and jewellery. This being exhausted a large debt was accumulating for board and lodging when a doctor on the Committee of the Fund heard of the case and referred her to the Fund. An immediate grant of £5 was made for food. The

Professional Classes Aid Council were asked to contribute towards the maintenance of the sister of the applicant, who is the unmarried daughter of a solicitor. A vote from them enabled the sister to be got away to be looked after as she is an invalid and crippled with rheumatoid arthritis, and our Guild found a post for the applicant and made a grant towards the debt outstanding for board and lodging. The Fund and Guild and Professional Classes Aid Council are working together to get the sister permanently looked after so that the applicant will be self-supporting.

Widow, aged 45, of L.R.C.P. Edin. who practised in Lancashire and died this year. She is left with three children, aged 6, 9, and 12, who are all at day school. After the practice was sold £500 was left and War Loan purchased. Applicant hopes to augment income by letting apartments. A report from the local branch of our Guild supported the application and the Fund voted £18 towards education and referred it to the Guild to consider a similar grant.

Widow, aged 36, of M.B. who practised in the Midlands and died in 1916. Applicant has been able to support herself and son, who is now 9 years of age, up to last November, when her mother died who looked after the boy whilst the applicant was at work. Help is asked for the child. The guardians have been applied to and a grant was made by them of 7s. 6d. a week for five weeks. The Fund voted £10 to a local doctor, who is interested in the case, to be administered for the benefit of the child.

M.R.C.S. Eng., aged 62, who is in practice and asks the Fund to help him while getting established. The practice is increasing, but he has only £42 in hand. Fund voted £40.

Widow, aged 54, of L.M.S.S.A. who practised as a ship's surgeon and died suddenly, leaving applicant and daughter, aged 17, totally unprovided for. Has been working as a servant but at present staying with friends. Voted £26 in six monthly instalments.

Subscriptions may be sent to Sir Charters Symonds, Hon. Treasurer, at 11, Chandos-street, Cavendish-square, London, W. 1.

HOSPITAL ADMINISTRATION.—A three months' course of lectures and demonstrations will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., by the medical superintendent, Dr. E. W. Goodall, on Mondays and Thursdays, at 4.45 p.m., and alternate Saturdays at 10.30 a.m., beginning Oct. 1st. The fee is £4 4s., and the course complies with the requirements of the revised regulations of the General Medical Council for the D.P.H. Further particulars may be obtained from the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4.

POST-GRADUATE COURSES IN TUBERCULOSIS.—The following courses have been arranged by the Joint Tuberculosis Council: (1) A fortnight's course, Sept. 21st to Oct. 3rd, at Victoria Park (class limited to six members); (2) a course in non-pulmonary tuberculosis, Sept. 28th to Oct. 3rd, visiting Ascot, Carshalton, London Hospital, Royal College of Surgeons, All Saints' Hospital for Genito-Urinary Diseases, and Oxford (class limited to 30 members). Early application should be made to William Brand, acting hon. secretary, 19, Brunswick-square, S.E. 5, who will supply all further particulars (in addition to those published in THE LANCET on August 22nd, p. 412).

THE PEOPLE'S LEAGUE OF HEALTH.—The Sims Woodhead series of constructive educational health lectures will commence on Friday, Oct. 9th, at 6 p.m., at the Regent-street Polytechnic, London, and will be continued on the following five Fridays at the same hour. Among those who have promised to lecture are: Sir Harry Baldwin, Dr. Leonard Hill, Prof. H. R. Kenwood, and Mr. E. B. Turner. At the conclusion of the series there will be an optional examination for those who have attended the series, and certificates will be issued by the Medical Council of the League. The fee for the series is 7s. 6d., single lectures 1s. 6d. Tickets and further information regarding the lectures held may be obtained from Miss Olga Nethersole at 12, Stratford-place, London, W. 1.

ARTIFICIAL SUNLIGHT AT DRURY LANE THEATRE. On August 26th Sir Alfred Fripp formally opened the artificial sunlight baths which have been installed at Drury Lane Theatre for the benefit of the company and staff. In opening the proceedings Sir Alfred Butt said that the directors believed that the greatest possible benefit would result from conserving the health of their employees, and the baths had been provided with this object. Every member of the company and staff could have a sunlight bath when desired, free of charge, provided the doctor approved. Sir Alfred Fripp gave a short address on the benefit of artificial sunlight and of the advantages of living as near to nature as possible; he said that he knew several prominent actors who had been greatly benefited by artificial sunlight baths, and congratulated the Drury Lane authorities on their generous action in providing this means for promoting the health of their staff and company. The installation is under the supervision of Dr. F. Howard Humphris, and Dr. Cecily Maude will be in charge at the theatre. The total radiation value is 100,000 candle-power and provides for about 60 baths per hour.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 7th, to SATURDAY, Sept. 12th.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Daily instruction in the out-patient department from 2.30 P.M. Special demonstration of cases on Tuesday.—INFANTS HOSPITAL, Vincent-square, S.W. Special Course. Lectures and demonstrations every afternoon. "Round Table" consultation on Friday, and on Saturday special visit to Model Pasteurising Plant.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross. Clinical instruction every afternoon from 2 o'clock with special demonstration three times a week.

Appointments.

CAPON, N. B., M.B., Ch.B. Liverp., has been appointed Hon. Physician to the Royal Southern Hospital, Liverpool.

LAIRD, JEAN P., M.B., Ch.B. St. And., Junior Resident Medical Officer, East House and Hospital, Dundee.

THOMSON, I. S., Ch.B. Aberd., D.P.H. R.C.P.S. Eng., Assistant Medical Officer of Health and Tuberculosis Officer for Westminster.

Royal Infirmary, Sunderland: ROBINSON, W. V., B.M., B.Ch. Oxf., and HAMILTON, NORAH, M.B., B.S. Durh., Anaesthetists. MILNE, J., M.B., Ch.B., Deputy Anaesthetist. ROBINSON, V. P., B.M., B.Ch. Oxf., House Physician.

St. Paul's Eye Hospital, Liverpool: GORST, P. E., M.D. Liverp., M.R.C.S., L.R.C.P.; PLUMMER, F. C., M.D. Liverp.; and GRAVES, B., M.R.C.S., L.R.C.P., Hon. Surgeons. BICKERTON, H. R., M.B., B.Ch. Camb., M.R.C.S., L.R.C.P., D.O. Oxf., D.O.M.S. Lond.; HUGHES, E. N., L.R.C.P., M.R.C.S., D.O.M.S. Eng.; and MOORHOUSE, I. H., M.B., Ch.B. Liverp., Hon. Assistant Surgeons.

Westminster Hospital: DUNLOP, H. A., M.R.C.S., L.R.C.P., Lond., House Physician; and DAVIES, A. E. C., M.R.C.S., L.R.C.P. Lond., House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: ANDERSON, D. I., M.B., Ch.B. Edin. (Hoddesdon, Hertford); CONYNGHAM, R. S., L.R.C.P. & S. Irel. (Snaith, West Riding); WILLIAMS, R. E., (Torpoint, Cornwall); and BOLTON, N. H. (Wrotham, Kent).

Vacancies.

For further information refer to the advertisement columns.

Ayr County Hospital.—Jun. H.S. £80.

Bradford Royal Infirmary. H.P. £150.

Brighton County Borough Sanatorium.—Res. M.O. £350.

Chiswick General Hospital.—Hon. Anaesthetist and Hon. Asst. Anaesthetist.

Denbigh County Council.—Asst. M.O. £600.

Dewsbury and District General Infirmary.—H.S. £200.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Halifax Royal Infirmary.—Third H.S. At rate of £150.

Hampstead, New End Hospital.—Jun. Res. Asst. M.O. At rate of £150.

Hospital for Tropical Diseases, Endsleigh Gardens, N.W.—H.P. at rate of £110.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Lancaster County Mental Hospital.—Temp. Asst. M.O. 7 guineas weekly.

Lister Institute of Preventive Medicine, Chelsea Bridge-road, S.W.—Jenner Memorial Research Studentship. £250.

London School of Hygiene and Tropical Medicine, Endsleigh-gardens.—Director of Medical Entomology. £900.

Manchester and District Radium Institution.—Asst. Radiologist. £500.

Manchester Royal Children's Hospital, Pendlebury.—Asst. M.O. At rate of £150. Res. Surg. O. At rate of £80.

Manchester, St. Mary's Hospitals.—Three H.S.'s. Each at rate of £50.

Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Anaesthetist.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £50.

Norwich, Norfolk and Norwich Hospital.—H.S. £150.

Nottingham Children's Hospital.—Res. H.P. and Res. H.S. Each at rate of £150.

Pharmaceutical Laboratories of the Pharmaceutical Society of Great Britain.—Director. £1200.

Prince of Wales's General Hospital, Tottenham, N.—H.S., Spec. H.S., and H.P. Each at rate of £150. Also Jun. H.S. and Jun. H.P. At rate of £110.

Queen Mary's Hospital for the East End, Stratford, E.—Cas. O.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S., H.P., and Cas. H.S. Each at rate of £100.

Radium Institute, 16, Riding House-street.—Cancer Research Worker. £500.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal National Orthopedic Hospital.—H.S. At rate of £150.

Royal Northern Hospital, Holloway, N.—M.O. to Out-patients. At rate of £125. Also H.S. and Obstet. H.S. Each at rate of £70.

St. Bartholomew's Hospital and College.—Res. Asst. Phys.-

Accoucheur and Demonstrator of Pract. Midwifery.

Salford County Borough.—Asst. Clin. Tub. O. £600.

Salford Royal Hospital.—Res. M.O. and H.S. At rate of £175

and £125 respectively. Also Radiologist. £300.

Singapore, Straits Settlements.—Two Asst. Health Officers. £7200.

Southern Rhodesia Government Public Health Dept.—Dentist. £650.

West London Hospital, Hammersmith-road, W.—H.P. and Two

H.S.'s. Each at rate of £100.

Whipp's Cross Hospital, Leytonstone.—Res. Asst. M.O. £350.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment for a Certifying Factory Surgeon at Bexhill, Sussex.

Births, Marriages, and Deaths.

BIRTHS.

BERRY.—On August 30th, at Glenthorne, Park-avenue, Watford, the wife of D. H. Berry, M.R.C.S. Eng., L.R.C.P. Lond., of a daughter.

BROWN.—On August 19th, at Bassett-crescent, Southampton, the wife of Dr. A. W. Brown, of a daughter.

GRAHAM-HODGSON.—On August 17th, at Grey Lodge, Chislehurst, the wife of Dr. Graham-Hodgson, of a daughter.

HAULTAIN.—On August 26th, at Walker-street, Edinburgh, the wife of W. F. Theodore Haultain, F.R.C.S.E., of a son.

RAMMELL.—On August 17th, at Swaffham, Norfolk, the wife of Dr. J. Rammell, of a daughter.

THOMPSON.—On August 23rd, at Eastbourne House, Devizes, the wife of James Thompson, F.R.C.S., of a daughter.

MARRIAGES.

BROADBRIDGE—HEAD.—On August 20th, at St. Marylebone Parish Church, Harold George Broadbridge, M.B., B.S. Lond., to Enid Muriel, only daughter of the late Mr. and Mrs. Robert Head.

CANNING—TURTON.—On August 19th, at St. Saviour's, W., Henry George Richmond Canning, L.R.C.P., M.R.C.S., L.D.S. Eng., to Ruth Helen Gwenth, only daughter of Mr. and Mrs. Turton, of Tintagel, Cornwall.

COWELL—SMITH.—On August 22nd, at Bideford Church, Dr. S. J. Cowell, to May Penelope, eldest daughter of Mr. and Mrs. Cecil Smith, of Link House, Westward Ho!

MCGRATH—TYNDALL.—On August 12th, at Blackrock, Co. Dublin, William M. McGrath, M.B., B.Ch., B.A.O., Cane Hill Mental Hospital, Coulsdon, Surrey, to Eileen, elder daughter of the late Mr. J. P. Tyndall, "Farmleigh," Stillorgan, Co. Dublin, and Mrs. Tyndall, Eaton-square, Monkstown, Co. Dublin.

OVERTON—BROMAN.—On August 26th, at the Savoy Chapel, Squadron-Leader R. S. Overton, M.R.C.S. Eng., L.R.C.P. Lond., R.A.F., of Sutton Lodge, Sutton, Surrey, to Justine Leontine ("Jean") Broman, of Oslo, Norway.

WHITAKER—WAITE.—On August 29th, at Knutsford, Cheshire, Sydney Morgan Whitaker, M.D. Brux., M.R.C.S. Eng., L.R.C.P. Lond., of St. Helier, Jersey, to Hilda Mary, widow of Lieut. J. Thorp Waite, 5th East Kent Regiment (The Buffs), and elder daughter of the late Frederic Smith, of Dunham Lawn, Bowdon, Cheshire.

DEATHS.

ACKLAND.—On August 17th, at The Circus, Bath, Donald Ackland, M.R.C.S., L.R.C.P. Lond., aged 50.

BRAMWELL.—On August 26th, at Corfe, Taunton, Herbert Bramwell, M.D., F.R.C.S. Edin., M.R.C.S. Eng., late Lieut.-Colonel, Gloucestershire Hussars, T.D., son of the late John Byrom Bramwell, of Tynemouth, Northumberland, aged 62.

BURROWES.—On August 16th, at Lemain, Looe, Cornwall, Henry Ambrose Burrowes, M.D., aged 60.

DILL.—On August 22nd, John Frederick Gordon Dill, M.D., Denmark Villas, Hove, aged 66 years.

DUNBAR.—On August 25th, suddenly, at Oakfield-road, Clifton, Bristol, Eliza L. Walker Dunbar, M.D. Zurich, L.R.C.P.I. and L.M., younger daughter of the late Alexander Walker, M.D., H.E.I.C.S., in her 80th year.

FOWLER.—On August 24th, at Brachead, Elie, suddenly, James Stewart Fowler, M.D., F.R.C.P. Edin., of Northumberland-street, Edinburgh, aged 54.

LANGDON-DOWN.—On August 19th, at Dixland, Teddington, Percival Langdon Langdon-Down, aged 57.

MARSHALL.—On August 24th, at Hove, John James de Zouche Marshall, V.D., L.R.C.S.I., L.M., L.A.H. Dub., Lieut.-Colonel (retired) R.A.M.C., T., aged 79.

ODELL.—On August 21st, at Ferndale, Torquay, William Odell, M.D., F.R.C.S., aged 74.

WALES.—On August 18th, at Downham Market, Thomas Garneys Wales, M.R.C.S., in his 93rd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HOSPITAL ORGANISATION.

To those concerned with the present problem of meeting the hospital needs of this country the series of handbooks on Hospital Organisation, Construction, and Management, published by the Macmillan Company of New York, should prove instructive. The first of the series, by Joseph J. Weber, M.A., editor of the "Modern Hospital," deals in a general way with the hospital field as we find it to-day, and some very striking figures are quoted, showing the rapid progress which has been made in the United States since 1873. In 1873 there were only 149 hospitals in the United States; at the beginning of 1923 there were in the United States and its possessions 7095 hospitals and sanatoriums, with a total patient bed capacity of 792,069. The ratio of hospital beds to the population is very striking; in New York City the actual hospital beds available in January, 1923, was five beds to every 1000 of population. The factors influencing the ratio of beds to the population are fully discussed, and it is noted that there is a very direct bearing between the number of hospital beds required and the housing conditions of the community. In estimating the hospital needs, one might calculate on 75 per cent. of the beds being utilised through the year. Mr. Weber indicates the procedure to be adopted by a board of trustees in the organisation of a hospital, and the various steps to be taken to arrive at the best results. The second volume is by Frank E. Chapman, director, Mount Sinai Hospital, Cleveland, and deals in detail with general administration, laying emphasis on the centralisation of administration. Various diagrams and tables are given showing how this is carried out in different parts of America, and the methods adopted in some hospitals are given in great detail. Many useful hints are given, which are worthy of careful consideration.

THE FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—The committee venture to ask you to allow them to make a very urgent appeal again for subscriptions and donations for the Factory Girls' Country Holiday Fund. Some of those who are hoping to go away during the next few weeks have never slept out of London. Our funds are very low, and we fear that in any case many will be disappointed of their little holiday this summer.

The need for this brief rest and change is probably more urgent than ever before. Trade depression has resulted in the girls becoming the main support of hundreds of families, which but for their earnings would be on the verge of starvation. The general standard of comfort in the average home is lower than it has been for many years, and the health of the community in the crowded and airless factory districts of London has deteriorated considerably. Nor is it possible for the girls to contribute as much towards a holiday as they have done in former years. Good food, rest, and fresh air for a short time would make it possible for many to continue their work through the coming winter, who might otherwise break down under the strain and privation they have had to bear for so many months. The short holiday will give them fresh hope and courage.

Subscriptions and donations will be thankfully received and acknowledged by Miss Canney, 75, Lamb's Conduit-street, W.C. 1.

We are, Sir, yours faithfully,

ALBERTA SANDWICH.	FRANK LLOYD.
MARY SCHARLIEB.	J. H. HERTZ,
MARY ST. HELIER.	Chief Rabbi.
A. F. LONDIN.	J. F. GREEN,
JOHN KENSINGTON.	Chairman of the Executive
August 27th, 1925.	Committee.

HEALTH RESORTS IN GERMANY.

THERE has recently been published in Berlin a large and comprehensive directory, compiled from official sources, of the various spas, watering-places, and health resorts of Germany. The compilers of this *Reichs Bäder Adressbuch* state that the publication is the first of its kind, and as a work of reference the sphere of its utility should be very extensive. The book is, of course, methodically constructed, the resorts being described and illustrated alphabetically in three sections, while an appendix deals with the large towns. A table of resorts grouped geographically follows the preface, and a general index completes the volume. Of particular interest to medical men is the index, in which the spas are grouped according to the disease conditions for which they are specially suited. The cost of the *Adressbuch*, containing 986 quarto pages, is 9.50 Rentenmarks.

MEDICAL MEN AND DEATH CERTIFICATES.

IN the House of Commons recently Sir Gerald Strickland asked the Home Secretary whether he was aware that it was not unusual for certificates of death to be signed by doctors without previously viewing the body after death and on the hearsay evidence of others; and whether he was prepared to propose legislation which would make it incumbent on doctors who signed death certificates to add thereto that they had ascertained to the best of their ability that death had actually occurred and was not merely apparent. This is a very old question, Mr. Neville Chamberlain replied, assuming reference to a certificate which the medical practitioner in attendance on a deceased person in his last illness is required by law to give, "stating to the best of his knowledge and belief the cause of death." He pointed out that the first part of the question gave the present position, but with regard to the latter part of the question he said that the whole subject is under consideration. The matter of death certification has waited for new legislation too long; some term ought to be put to the delay.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

THIS society has now on its register over 5500 masseurs and masseuses, the majority of whom are qualified to administer treatment by massage, remedial exercises, and medical electricity under medical directions. The society was incorporated by Royal Charter in 1920, and its efforts towards the establishment and maintenance of a careful training in this important ancillary branch of the healing art have done much to secure a worthy place in the ancillary ranks of medicine for the masseur and the masseuse. Admission to the register is obtained by examination. Independent examinations are provided and supervised in London, at various centres in the provinces, in Scotland, and in Ireland, the subjects of examination extending to anatomy, physiology, pathology, massage, remedial exercises, and medical electricity. Many well-known medical men and women, specialists in these subjects, act as examiners, and no member can receive a certificate until a qualified medical practitioner has been satisfied with the candidate's proficiency. The society's register shows that members are now practising throughout the United Kingdom, in the Colonies, and elsewhere. Lists of members practising in any particular district or a copy of the register may be obtained from the secretary of the society, 157, Great Portland-place, London, W. 1.

COUGHING EPIDEMIC IN MILLS.

A MYSTERIOUS epidemic of coughing has broken out among weavers in Burnley mills. It makes them so ill that they have to cease work, and others who have taken their places are similarly affected. Operatives when they return to the mill are again affected. This is the third time such an outbreak has occurred in Burnley mills, the last occurrence being 12 years ago. It has been decided to close the mills for a week, when all suspected apparatus will be removed. In one of the previous outbreaks the cause was believed to be mildew in weft, but it appears that this outbreak was not due to the weft.

CIVIL SERVICE BONUS.

THE Minister of Health announces, on information received from the Lords Commissioners of H.M. Treasury, that the review on Sept. 1st, 1925, of Civil Service bonus will be on the basis of an average cost of living figure of 75, that is, on the same basis as obtained during the six months commencing Sept. 1st, 1924.

MEDICAL EDUCATION IN MISSOURI.

"If Governor Baker is far-sighted, he will purge Missouri at once of the noisome mess," is the comment of the *Journal* of the American Medical Association on certain curious positions in medical and public relations that have arisen in the State. "Noisome" is hardly too violent an adjective if the suggestions in our contemporary are warranted, for we have stories of money received to influence the Secretary of the State Board of Health, of appointments to the State Penal Board in return for political services given by persons whose records are shadowed by political intrigue, and names are employed throughout. The position reached is, that the Board of Health of the State, having issued an ultimatum that they would resign, are now embarrassed by finding that, if they are loyal to their ultimatum, they will leave the field to the Governor and to one surviving member, when new men can be appointed to cover up the whole situation. The use of strong language by our contemporary appears warranted.

Principles

OF

TREATMENT BY MANIPULATION OF SOME CHRONIC DISORDERS OF THE KNEE-JOINT FOLLOWING INJURY.

BY A. G. TIMBRELL FISHER, M.C.,
F.R.C.S. ENG.,

LATE HUNTERIAN PROFESSOR OF THE ROYAL COLLEGE OF SURGEONS
OF ENGLAND; SURGEON (WITH CHARGE OF OUT-PATIENTS)
AND JOINT LECTURER ON OPERATIVE SURGERY,
DREADNOUGHT HOSPITAL.

AN attempt will be made in this paper to point out the underlying pathology of those chronic affections of the knee-joint following injury that may be cured or markedly alleviated by that valuable and often brilliant therapeutic measure, manipulation.

The medical historian of the future will have to record that our profession has greatly neglected this important subject and has shown too often a tendency to prescribe rest when movement has in reality been indicated, adhering to the dictum "rest inflamed structures" when the cause of the chronic inflammation has been some intra-articular condition which a lifetime of rest or its concomitants, plaster, Scott's dressing, and strapping would not cure, but which could often have been rapidly cured by special manipulative methods. The fact must be faced that the bone-setter has been curing multitudes of cases by movement, many of which have previously been ordered too prolonged rest by our profession, even by its most eminent members, and that by our often faulty methods we are largely responsible for his very existence. It is churlish and dishonourable under these circumstances to throw exaggerated emphasis on the dangers of bone-setting, real though they be, and to minimise the good work for humanity that some of the best of these unqualified practitioners have performed.

Wharton Hood wrote more than 50 years ago:—

"The belief in the great value of rest in such cases may be regarded as a tradition handed down from the time of Sir Astley Cooper, who said, 'In no cases, after injury, should the patient be allowed to exercise the parts as usual, until all pain has ceased and the part has nearly regained its original form.'"

Hilton and H. O. Thomas perpetuated this teaching. Although half a century has passed since these words were written, the tradition is still firmly rooted in certain circles.

There are a large number of different lesions affecting the knee-joint which may occur after trauma. It is proposed to enumerate first examples of the after-effects of an exceedingly common form of injury—viz., sprain of the internal lateral ligament, although much will apply to other sprains of this joint. Afterwards we shall shortly discuss the after-effects of contusions, lesions of the semilunar cartilages, toxic or infective synovitis, chronic arthritis, combined cases, and functional cases.

Space will not permit here of any description of manipulative technique, and for this reason a number of illustrative cases are also omitted. Further details will be found in a forthcoming publication.

SPRAINS OF INTERNAL LATERAL LIGAMENT: PREVENTION OF ADHESIONS.

Much that follows in this section applies also to sprains of other ligaments of the knee such as the external lateral.

The general treatment of such sprains, and the prevention of adhesions resulting from synovitis following a sprain of a lateral ligament, can be summed up in a few words—viz., "Rest from all undue strain of the damaged ligament combined with early movement of the joint." At first sight this maxim may seem

contradictory, but in reality this is not the case. Rest from weight-bearing and excessive use permits healing to proceed, but early movements, at first of but short duration, prevent the formation of adhesions. The principle of early movement, admirable though it be, is not sufficient, for unless we aim at early movement *through its full range*, adhesions may yet develop and give rise to much subsequent trouble.

Let us attempt to illustrate the principle of the prevention of adhesions by a concrete example, viz.:—

Treatment of a Case of Synovitis of the Knee following a Sprain of the Internal Lateral Ligament.

Rest in bed or on a couch is enjoined at first. This is combined with a firm compression bandage over a thick layer of wool, which should completely surround the joint and extend for some little way upwards into the thigh and downwards into the leg, leaving a small fringe of wool above and below uncovered by the bandage. No splint should ever be used, but the joint slightly flexed over a pillow, for experience has shown this to be the position of greatest ease. Rest from weight-bearing must be enjoined as long as the synovial effusion persists. From the very first the bandage is removed daily and gentle massage (effleurage), electrical stimulation of the quadriceps, and movements may be instituted, for these, added to the elastic compression, play an important part in the absorption of the intra-articular effusion and prevent muscular wasting. Each day the movements are increased. In about a week in marked cases, or considerably less in minor cases, effusion will have subsided, and it should be our aim to have obtained full movements by this time.

There is now no objection to weight-bearing, provided strain upon the recently damaged ligament be eliminated, and this can usually be ensured by the simple device of reinforcing the inner sides of the sole and heel by a wedge-shaped piece of leather $\frac{1}{4}$ in. in thickness, or in severe cases rotation and abduction may be prevented by the temporary use of a knee-cage which permits flexion and extension. For a short period, and especially if there is any tendency to swelling occurring after exercise, a compression bandage should be worn during the day. This, however, should be dispensed with as soon as possible, as it tends to interfere with the development of the thigh muscles. As this swelling is often due to loss of tone of the thigh muscles, every effort should be made to remedy this by re-education.

Treatment of Chronic Cases.—It has already been mentioned that in many of these cases we are faced with a set of conditions constituting a vicious circle. The sprain has given rise to synovitis; this causes reflex wasting of the thigh, and the resulting laxity of the capsule still further predisposes to minor traumata of the synovial membrane and delayed absorption of synovial fluid. It should be pointed out that the tenderness over the internal lateral ligament is due to the presence of scar tissue, which may be present not only in the ligament itself, but in the synovial membrane lining its deep surface which, indeed, may be adherent to the scar. Now this scar tissue when stretched gives rise to a sensation of acute pain and a reaction in the joint, and hence the recurrent attacks of pain and effusion after exercise. The presence of scar tissue in excess is the *fons et origo* of the group of symptoms, and the great principle of treatment is to deal with this and subsequently to concentrate upon the treatment of the resulting and concomitant conditions. The latter are sufficient in themselves to give rise to serious trouble and a continuance of symptoms after the internal lateral ligament has ceased to be a source of trouble *per se*. The ideal treatment of the original lesion, as we have seen, is so to direct Nature's efforts that the scar formed is not in excess—neither should it cause any interference with movement, but neither should it be unduly stretched. By early movements there can be no doubt that we may prevent the adhesion of the synovial membrane to the scar in the internal lateral ligament. When adhesions have actually developed which persist after a fair trial has been given of gymnastic exercises, the vicious circle may be broken and the patient put on the high road to recovery by manipulation. In some slight cases this measure is all that is necessary, but in neglected cases the after-treatment is of great importance and must follow two important lines.

(1) The increased range of movement obtained by manipulation must be preserved, and the ground gained consolidated by the patient voluntarily exercising the joint through the increased range at regular intervals, commencing almost immediately.

(2) The wasted thigh muscles must be made to recover their tone and bulk by re-education. It will be then noted that the lateral mobility hitherto present will usually disappear. In some minor cases the adhesions may be gradually stretched and full movement restored by gymnastic exercises; this process is, however, longer, more tedious, and less reliable than manipulation under anaesthesia.

Pathology of Cure by Manipulation in Cases of Neglected Sprain.—The internal lateral ligament is stretched on full extension but relaxed during flexion. It is difficult therefore to explain the actual mechanical limitation of flexion on the supposition of the presence of scar tissue in the ligament itself. To appreciate better the pathological condition present the anatomy of the region should be recalled.

Surgical Anatomy.—The relationships of the various parts may be seen from a reference to Figs. 1 and 2. It will be seen that beneath the upper part of the internal lateral ligament near its femoral attachment is a synovial pocket or recess which forms part of the synovial reflection from the femoral condyle to the capsule. Normally the two layers of synovial membrane are in contact, and the internal lateral ligament is in contact with the outer synovial layer. In ruptures, either partial or complete, of the long portion of the internal lateral ligament, it is clear that the synovial membrane must participate

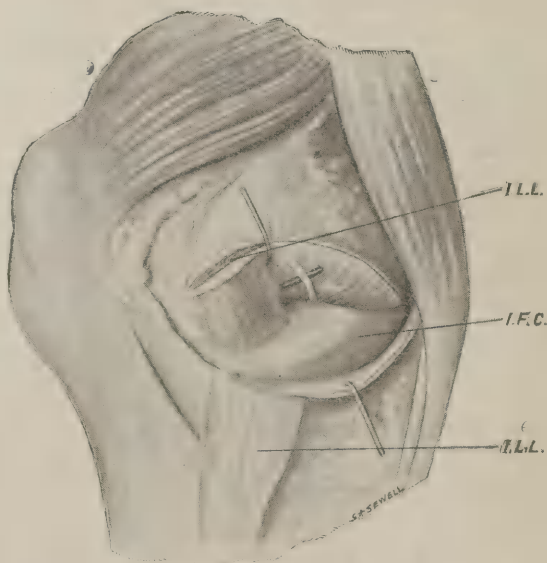
where the synovial membrane lines the deep surface of the coronary ligament and is reflected from it to the margin of the tibial condyle (Fig. 2). It is probable that after ruptures of the deep fibres of the internal

FIG. 2.



Coronal section through anterior part of knee-joint showing synovial pockets above and below semilunar cartilages.

FIG. 1.



Dissection of inner aspect of knee-joint showing synovial pocket beneath internal lateral ligament and adjacent part of capsule. The rod is inserted beneath an adhesion. I.L.L. = internal lateral ligament. I.F.C. = internal femoral condyle.

therein, and that, if the joint be left at rest, the two opposed layers of synovial membrane must become glued together by inflammatory exudate which may become organised with the formation of a definite adhesion. Furthermore, the outer layer of synovial membrane must become adherent by fibrous tissue to the scar in the ligament.

There is no greater contributory factor in the formation of these adhesions than prolonged treatment by complete rest, plaster, Scott's dressing, and strapping. In fact, the adhesion of the two opposed layers of synovial membrane is made almost certain thereby. Another shallow synovial pocket is also present beneath the attached margin of the semilunar,

lateral ligament adhesions are particularly liable to form at this site, giving rise to persistent tenderness. The tenderness at this site is often quite erroneously thought to indicate a displaced semilunar cartilage, and when, as so often happens, a complete cure results from manipulation in this type of case, the bone-setter has often obtained the credit for curing a displaced cartilage of long standing.

CONTUSIONS OF THE KNEE-JOINT.

The most characteristic symptom of contusion is that the pain and tenderness are localised to the affected area and remain thus localised for a considerable period, and in some cases a troublesome form of periostitis ensues. Contusions, like sprains, are very liable to be followed by synovitis with effusion, and much that has already been said concerning the general pathology of adhesions in cases of sprain applies also to adhesions following contusion. There is, however, a great tendency in the latter cases for the adhesions to be more generalised, and although they may occur almost anywhere, they tend to be more marked in the front and lower part of the joint, in the region of the infrapatellar pad of fat and its processes, and at the lateral synovial reflections. The adhesions may be of great delicacy and yet potent of much trouble, or of a somewhat extensive nature. Localised tenderness is often present, with limitation of some particular movement or movements. In this connexion the movements of the patella laterally and the rotatory and "screw-home" movements should always be tested. The pathology of this type of case is described more fully in the author's book.¹

CHRONIC OR RECURRENT LESIONS OF THE SEMILUNAR CARTILAGES: THEIR DIFFERENTIAL DIAGNOSIS AND MANIPULATIVE TREATMENT.

We are not here concerned with the question of manipulation in original displacements of the semilunar cartilage, although it may be mentioned that there is no evidence that early movements after

¹ Internal Derangements of the Knee-joint; their Pathology and Treatment by Modern Methods. H. K. Lewis and Co.

reduction, provided rotation be avoided, are less efficacious in bringing about union than the long period of immobilisation that is often ordered, which is apt to lead to the pernicious after-effects of adhesions and wasting.

The author has investigated the problem of repair in the semilunar cartilages experimentally, and has also examined microscopic sections of fractured semilunar cartilages removed at operation at various intervals from the original injury. These investigations all point to the fact that repair is sluggish in the menisci (Figs. 3 and 4).

It must never be forgotten that in most cases a lesion of the internal semilunar cartilage is in essence a complication of a severe sprain of, at any rate, the deep fibres of the corresponding lateral ligament. There will therefore be a somewhat similar history to that of sprain and a certain similarity in the points of tenderness. In many chronic cartilage lesions, however, tenderness is completely absent. Protrusion of the fractured cartilage outwards, although mentioned in many text-books, is, in the author's opinion, excessively rare, but a peculiar "rumble" or "snap" on flexion and extension is almost pathognomonic of a torn meniscus.

The most characteristic feature about a recurrent lesion of a semilunar cartilage is the history of one or more attacks of true mechanical locking, which may be momentary or last until reduced by manipulation, which often occurs with an audible snap. Very frequently mechanical locking occurs at the original

history and in the complete absence of any physical signs, and has almost invariably found in such cases a torn cartilage. True mechanical locking must, of course, be very carefully distinguished from limitation of movement due to synovial effusion and pain, which in the original injury are of later onset, and from other forms of mechanical locking as may occur with loose body or certain injuries to the tibial spine.

In some cases the symptoms of semilunar derangement are less typical. For instance, it is obvious that if merely a slight tear is present this will not bring about true locking, and the symptoms will approximate more to those of sprain of the corresponding lateral ligament, and often there will be a complaint of giving-way rather than of true locking. In the author's opinion it is impossible to diagnose this type from sprain, and it should be treated as the latter at first. Suspicion should be aroused if the symptoms of the sprain persist over an unusually long period, when no limitation of movement suggesting adhesions is present, when all other causes have been excluded (a radiogram being never omitted), and when manipulation followed by a course of re-education of the wasted muscles fails to cure the condition. In such a case exploratory arthrotomy is certainly justifiable, preferably by the author's patella-displacing approach, through which all the structures in the anterior compartment of the joint may be exposed to vision.

To sum up, our sheet anchor in diagnosis between sprain of the deep fibres of the lateral ligament alone and a lesion of the corresponding meniscus must be an accurate and painstaking history. The position of maximum tenderness helps in some cases, but is often fallacious. There is a type of case in which, in the present state of our knowledge, having ruled out of court by a complete investigation other forms of internal derangement, it is impossible to say whether a patient is suffering from the sequelæ of a sprain or whether he has one of the less common types of lesion of the internal meniscus. In my opinion the practitioner should proceed upon the following lines in this difficult type of case. He should explain the position to his patient and advise a manipulation first, for this is simple, free from risk, and often succeeds. In the event of failure, exploratory operation should then be advised.

Underlying Pathology of Manipulation in Lesions of the Semilunar Cartilages.

It may be stated at once that in the author's opinion, although manipulation in cases of neglected sprain or contusion associated with adhesions is a most valuable therapeutic measure, this method of treatment is not quite so satisfactory in recurrent lesions of the semilunar cartilages. Cases of apparent cure occur, especially when too long an interval has not elapsed since the primary lesion, but in some the benefit is of a temporary nature. This fact depends upon the physiology of repair in the semilunar cartilages. Repair is at best sluggish, and when the fractured surfaces have become smooth and endothelialised (Fig. 3) the repair is even more slow, but if accurate apposition is maintained is quite possible.

A fact of fundamental importance in this connexion is that the commonest lesion of a semilunar cartilage is a definite tear which usually takes the form of a complete longitudinal tear or "bucket-handle" type of lesion (Figs. 4 and 5), and the characteristic symptoms of the semilunar derangement are due to the behaviour of the fractured portion of cartilage. It is most important to remember that it is quite possible for the inner torn portion, if narrow, to occupy certain abnormal positions without giving rise to any permanent "locking" or limitation of movement or, indeed, to any physical signs whatsoever. For instance, the inner portion may be in the intercondylar space between the crucial ligament and the femoral condyle, and it is only when some sudden turning movement causes the portion of cartilage to slip outwards that giving-way or locking occurs.

FIG. 3.



Transverse section of fractured surface of semilunar cartilage of long standing. The surface is smooth and in places covered by an endothelial layer.

accident, and thereafter attacks of sudden giving-way associated with a loud report, crack, or snap, rather than true locking; or, on the other hand, locking may not occur at first, but on subsequent occasions.

One of the most striking features in the differential diagnosis is the excellent and often detailed history that the patient gives. He or she will even demonstrate the exact position of the limb which produces the "locking." A young baronet in whose knee-joint the author found tears of both semilunars told him that any turning movement caused a report "like a double-barrelled gun," and down he fell. The author has frequently felt justified in exploring a knee-joint purely on such an accurate and careful

If, however, the inner portion is broad, it cannot be in such a position without causing mechanical interference with extension. These facts have all been confirmed on several occasions at operations by the author. This frequent absence of mechanical interference with movement, even when a fractured portion of a semilunar occupies some abnormal position, has hitherto been largely overlooked, but seems to have been known to the bone-setter. It seems fairly clear that what the bone-setter achieves in this type of case is to cause the displaced fragment to retrace its steps, when, in a certain proportion of cases, sufficient repair may take place between the two fragments to prevent recurrence. The chances of repair must clearly depend upon the age of the lesion. In time the fractured surfaces become smooth and rounded, and in these late cases the chances of repair are proportionately lessened. Again, in cases of multiple tear the chances of permanent recovery by manipulation are very slight. My operation findings, moreover, convince me that in certain cases in which manipulation has been performed, the fractured portion of the cartilage has been forced into the intercondylar region between the femoral condyle and crucial ligament, where from its position it has given rise to continuance of symptoms, and by slipping periodically between the femoral condyle and the tibia has caused attacks of giving-way or actual locking.

To sum up, the commonest lesion of a semilunar cartilage is a definite tear, and most commonly the complete longitudinal tear or "bucket-handle" type (Figs. 4 and 5). At the original accident the inner torn portion is usually dislocated into the interior of the joint, where, being fixed at first between the femoral and tibial condyles, it gives rise to a mechanical block to extension.

By manipulation two things may happen: (1) The displaced portion may retrace its steps and, provided rotary movements are avoided for some time, repair will probably take place. (2) The displaced portion may be forced still further into the interior of the joint, when the mechanical locking is released, but symptoms become recurrent. In these recurrent cases the fractured portion may yet be made to retrace its steps by manipulation, and repair by fibrous tissue gradually occurs.

There is a group of conditions to which I particularly desire to draw attention that interfere with the normal "screw-home" movement of the inner femoral condyle, and which are particularly amenable to treatment by manipulation. These are: (a) Minor displacements of the anterior half of the internal semilunar cartilage due to stretching or tearing of the coronary attachment; (b) inflammatory induration of the semilunar process of the infrapatellar pad of fat with adhesions in connexion with the latter process.

(a) Minor Displacements of the Anterior Horn of the Internal Semilunar.

To refer briefly to the anatomy of this important region. If a transverse section be made through the knee-joint at the level of the semilunar cartilages, it will be seen that the internal semilunar, in addition to the attachment to the true capsule, is firmly adherent to the deep fibres of the internal lateral ligament, and behind this to the aponeurotic layer. The anterior half of the cartilage, however, is separated from the aponeurotic layer by a well-marked interval filled with loose fatty tissue, and the periphery is attached to the margin of the internal tibial condyle by a portion of the true capsule, known as the coronary ligament. A weak mechanical site therefore exists at this spot where the mobile anterior half meets the more fixed posterior half, opposite the level of the internal lateral ligament. A sudden twist inwards of the femur upon the fixed tibia with the knee slightly flexed may, without causing a definite tear of the cartilage or of its anterior attachment, cause a partial rupture of the coronary attachment and a minor displacement, not sufficient to cause obvious locking, but a feeling of discomfort on full extension, which may be limited by a few degrees.

(b) The Semilunar Extensions of the Infrapatellar Pad of Fat.

In the investigation of 100 formalin-hardened knee-joints I found that the anterior one-third of the internal semilunar cartilage is usually protected by a process of the infrapatellar pad of fat, upon which the important screw-home movement of the internal femoral condyle occurs at the termination of extension; and this process is frequently injured, either alone, or simultaneously with injury of the anterior end of the internal semilunar. Although the process is so important clinically, it has not been considered worthy of a name by the anatomists, although it is often wrongly called the inner alar pad. Possibly "semilunar process" or "pad" might be a better name. In a large number of cases in which it is considered that a lesion of the cartilage is present, it is really this process which is at fault. A lesion of the process may be followed by the formation of adhesions between it and the cartilage, or some other adjacent structure. It seems clear, however, that it is in this group of conditions that manipulation is a valuable therapeutic measure.

We must never overlook another very important fact before deciding that any case has been cured by manipulation—viz., that long intervals which in some cases may amount to many years may normally exist between attacks of "locking," and therefore we can never be logically certain that we have really effected a permanent cure in any given case. If a definite recurrence occurs after a manipulation, operation should in most cases be advised, although occasionally a second manipulation may succeed.

MANIPULATION IN TOXIC OR INFECTIVE SYNOVITIS AND CHRONIC ARTHRITIS.

This condition is very liable to follow any of the aforementioned injuries of the knee in persons past the meridian of life. It is not proposed to discuss its pathology here as the author has previously discussed it in various publications.

The remarks already made concerning the misapplication of rest apply with redoubled force to this group of conditions, in which the articular surfaces are but little affected and the disease is principally situated in the synovial membrane. This leads in most cases to a certain amount of painful limitation of movement due to intra- and peri-articular adhesions.

Unfortunately, the symptoms due to the presence of these adhesions are often mistaken for some progressive disease, and what not infrequently happens is that the patient receives every conceivable form of medical treatment and wanders from one spa to another with the knee fixed in an orthopaedic apparatus, and the movement for which the joint is clamouring is withheld. When such a joint is fixed it is physiologically placed at the greatest disadvantage for combating any smouldering infection that may be present, for the circulation not only of blood but of lymph, and the secretion and absorption of the synovial fluid, depend largely upon regular movement. When complete rest is enjoined, the formation of synovial fluid is very markedly diminished, and the amount of fresh blood-bearing phagocytes and antibodies is reduced to a minimum.

One of the principal complaints in this disease is of stiffness and discomfort of the joint after the night's rest or after sitting still for some time, but which disappears after exercise. Over-exertion is, of course, to be most carefully avoided, but the practice of completely immobilising the joint in this type of case is contrary to the dictates of reason or even of common sense.

In chronic arthritis of what the author has designated the chondro-osseous and mixed types in which the articular surfaces are also involved, the principle of preserving movement, if this is possible, should be maintained. In these chronic cases Nature is endeavouring in a remarkable way to form a new

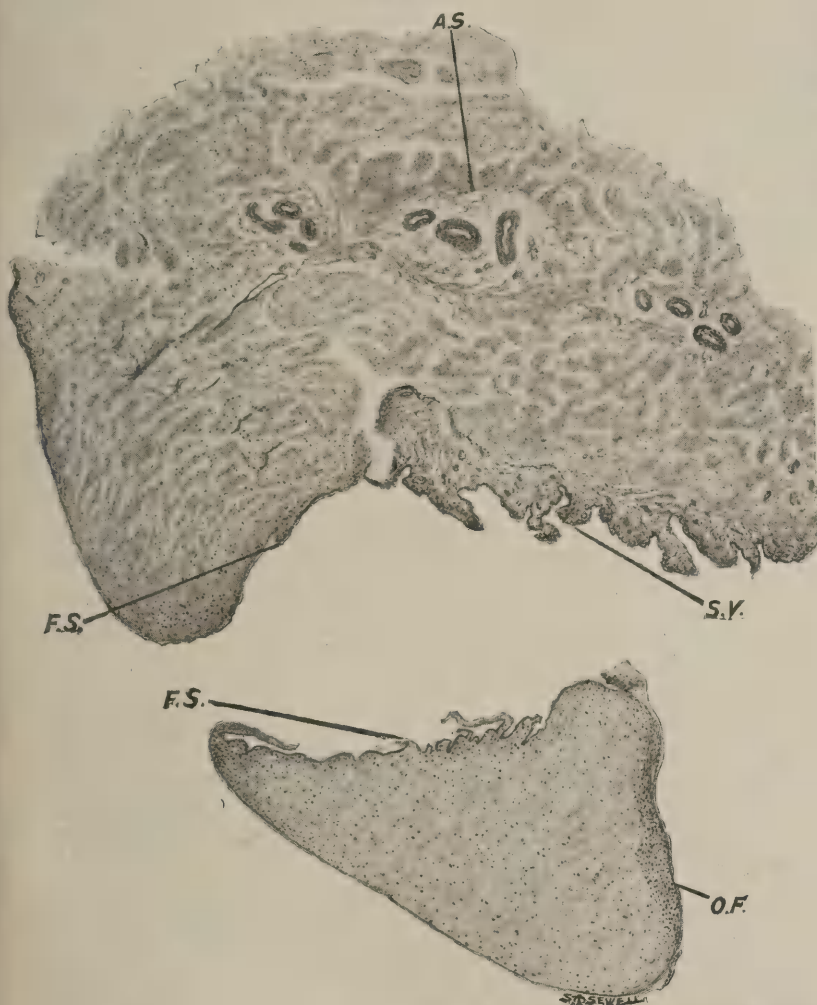
joint, and the patient, if possessed of the necessary determination, can assist the process very materially.

The author has endeavoured to show that a fundamental feature is degeneration of the central poorly nourished part of the articular cartilage and proliferation, which is often compensatory, of the lateral better-nourished portions whereby chondro-osteophytes are formed. Nature makes good the loss of the central part of the articular cartilage by sclerosis and eburnation of the subarticular bone, and the chondro-osteophytes extend the articular

destroyed. In cases in which these principles have been neglected, an effort should always be made in the first place to restore full movement by manipulation. It is often assumed, and this applies particularly to the hip-joint, that if marked osteophytes are present nothing short of open operation can be of any avail. It is surprising to find in many of these cases that the limitation of movement actually due to osteophytes is much less than one would imagine and that by manipulation a marked increase of movement may be obtained.

A strong tendency exists in many quarters to the formation of a fixed joint by excision in these cases. In my opinion this is very rarely necessary and should only be performed as a last resource. It is a tragedy to consider how often this operation is quite unnecessarily performed. A fixed joint is a considerable disability in itself; for instance, an ankylosed hip in good position is usually assessed at 60 or 70 per cent.

FIG. 4.



Transverse sections of both fragments of a "bucket-handle" lesion of the internal semilunar cartilage after six weeks. The upper or attached portion is well supplied with blood-vessels and repair of the fractured surface has occurred. Blood-vessels are conspicuously absent in the lower portion—the "handle of the bucket"—and there is no evidence of repair. F.S.=fractured surface. S.V.=synovial villi. O.F.=outer fragment. A.S.=attached surface.

surface. If regular movements through complete range are maintained from the first the following benefits result. 1. Contracture of scar tissue, both intra- and extra-articular, and painful limitation of movement is prevented. 2. Mechanical obstruction of movement by osteophytes is also prevented. 3. The process of eburnation is materially assisted. 4. Muscle tone is preserved. 5. The nutrition of the joint structures is maintained.

Many persons are able to lead active lives when all the evidence points to the fact that the articular cartilage in the affected joint has been largely

picture may be greatly complicated by the super-vention of a toxic synovitis or chronic arthritis, both of which may be localised or generalised, and in other cases the damaged ligament appears to be picked out by circulating toxins and the picture complicated. This is particularly liable to occur in persons past the meridian of life, and suspicions are aroused by three factors: (a) the existence of "rheumatic" symptoms elsewhere or a history of them; (b) when recovery from a sprain is unusually prolonged; (c) the presence in the patient of some focus of toxic absorption.

FIG. 5.



Typical example of complete longitudinal tear ("bucket-handle" lesion) of internal semilunar cartilage, which constitutes by far the commonest pathological type of lesion.

disablement. Cases have come to my notice on which the operation has been performed on young persons in which it was quite clear that sufficient had not been done to secure a movable joint.

Mixed Cases.

In certain cases of sprain or cartilage lesion the clinical

FUNCTIONAL DISORDERS OF THE KNEE-JOINT
FOLLOWING INJURY.

This is a large and important subject to which it is impossible to do justice in a short paper, and attention is merely drawn to a few special points which are sometimes overlooked.

1. An injury associated with marked mental shock, such as a railway or motor-car accident in which the knee is injured, is particularly liable to give rise to a neurosis in an individual of a nervous temperament. There is no surgeon of great experience who has not at some time been puzzled or misled by a functional condition of the knee.

2. A purely functional condition may occur from the first, or more frequently the condition is superadded upon some such condition as a slight degree of chronic synovitis or arthritis. The unwary or inexperienced may overlook the functional element, and consider that the symptoms and signs betoken a much more marked degree of arthritis than is actually present.

3. Quite apart from the question of injury it must be remembered that a functional element is very frequently quite a marked feature in chronic arthritis in both sexes. These are the cases of "rheumatoid arthritis" of many years' standing which are cured by "faith-healers."

4. In an early functional case, if spasm be abolished by anaesthesia, full movement can be obtained readily. If, however, the condition is of long standing, actual adaptive shortening of ligaments and periarticular structures occurs.

This is, of course, more liable to occur if the condition has been superimposed upon a slight degree of chronic synovitis or arthritis.

5. Even in primarily functional cases swelling of the joint may occur probably from the general loss of tone of the thigh muscles and impaired absorption of synovial fluid. It may then be a moot point whether the functional condition is primary or secondary.

6. Manipulation is by far the most effective therapeutic measure in these functional cases owing to the powerful suggestion of the anaesthetic. Treatment by suggestion should, however, precede and immediately follow the anaesthetic, and be carried on for some weeks or months subsequently.

7. The after-treatment is often of more importance than the manipulation itself, and not only the surgeon, but everyone with whom the patient comes in contact, must endeavour to convince the patient that he or she is now cured.

8. The prognosis in these cases depends upon the time that the condition has been present, in cases of long standing the prognosis is less hopeful. Even more, perhaps, depends upon that indefinable but all-important attribute, the personality of the surgeon who performs the manipulation.

In conclusion, much work remains to be done before bone-setting is placed upon a scientific basis. Let us hope that for the honour of our profession workers will not be lacking, so that we shall eventually arrive at the truth.

SOME
Practical Considerations
IN THE CONSERVATIVE TREATMENT OF
**FRACTURES OF THE PELVIS AND
LOWER EXTREMITY.**

*A Course of Four Lectures delivered for the University of
London at St. Bartholomew's Hospital*

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LECTURE IV.*

FRACTURES ABOUT THE KNEE-JOINT.—(Continued.)

FRACTURES OF THE PATELLA.

THERE are certain cardinal points in connexion with fractures of the patella to be borne in mind. (1) In comminuted and longitudinal fractures conservative treatment is followed by bony union. (2) Transverse fractures should be treated by operation, but nevertheless an excellent functional result may follow with wide separation of the fragments. I have an intimate friend who fractured his patella about 20 years ago. He has wide separation of the fragments, but walks without a limp and without inconvenience, and takes strenuous exercise. (3) Operation followed by bony union is not always followed by a good functional result. (4) If the fracture occurs near the ligamentum patellae, the knee-joint may not be opened, as the synovial membrane is reflected from the posterior surface of the patella some distance from the inferior tip of the bone. (5) Circumstances will arise when a fractured patella cannot be sutured under favourable conditions, and if the conditions are not ideal the attempt should not be made.

The first part of conservative treatment is to get rid of the effusion. To accomplish this, the limb should be elevated to relax the quadriceps extensor muscle and a tight bandage applied over several layers of wool. A practical way of helping absorption is suggested by Scudder:

Two slightly moistened bath or carriage sponges are allowed to dry under pressure sufficient to flatten them.

* Lectures I., II., and III. appeared in THE LANCET of August 15th and 22nd and Sept. 5th respectively.

These are placed upon each side of the knee and over it, and are held by a few turns of a roller bandage. Cold water is then poured over the whole. As the sponges absorb the water they enlarge, causing equable and firm pressure on the knee, thus very materially hindering the accumulation of fluid and favouring its absorption. This dressing is repeated every day. When the effusion has disappeared a calliper splint can be applied, in the manner recommended by Jones. The calliper splint should be worn for about two months. Full flexion of the knee should then be restrained for a time by a knee-cage, to prevent gradual separation of the fragments.

There are many other methods employed, the "Middlesex Hospital" method being one of the best.

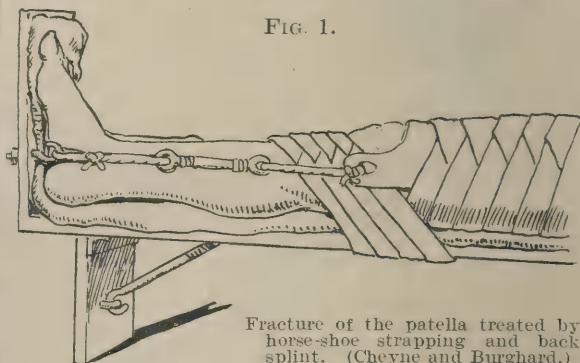


FIG. 1.

Fracture of the patella treated by horse-shoe strapping and back splint. (Cheyne and Burghard.)

Fig. 1 shows the upper fragment pulled down by a horse-shoe shaped strapping to the foot-piece of a back splint.

Operative Treatment.

In dealing with fractures of the patella by operation we must be certain that the largest synovial cavity in the body is not exposed to the slightest risk of accidental infection. If a disaster occurs the knee will be partially or completely stiff. If partially, the joint will be painful. Amputation of the thigh may become necessary in severe sepsis.

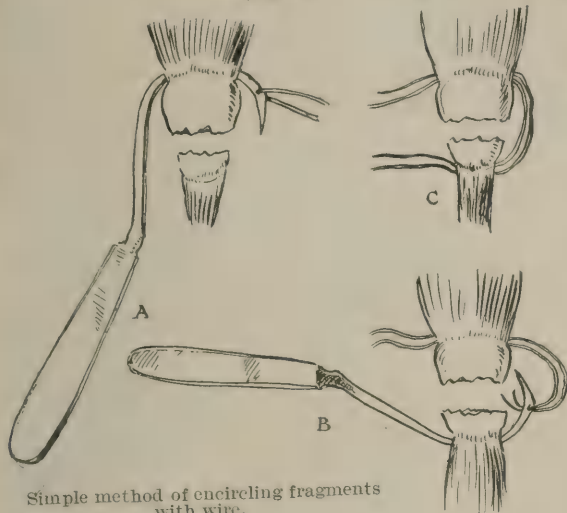
I have never performed any complicated operation, such as plating or bone grafting, for fractured patella. A simple procedure is adopted:

The joint is opened between the two fragments by a curved or transverse incision. Clots and torn tissues are cleared away from between the fragments. Doyen's or Reverdin's needle is passed through the quadriceps tendon in close contact to the upper margin of the patella. The needle is threaded with a fine loop of aluminium bronze wire and pulled through. The loop is cut and the needle is passed through the ligamentum patellae in close contact to the lower

border of the lower fragment; the double wire is again threaded and pulled through. The ends of the wire are now twisted and tied tightly, bringing the two fragments into apposition by an encircling suture. The torn portions of the capsule and aponeurosis are stitched with a few points of catgut. The wound is dressed. No splint is applied, and the patient is allowed to practise voluntary movements from the beginning, so far as he is able to do so without pain. (Fig. 2, A, B, and C.)

I have found that these cases walk about with the help of a stick after a fortnight or three weeks, and

FIG 2.



Simple method of encircling fragments with wire.

that they return in two or three months with bony union and full movement of the joint.

FRACTURES OF THE TIBIA.

Fractures of one or both condyles of the tibia occur either as the result of distortion or from direct violence, just as in the case of fractures of the condyles of the femur. They may or may not involve the joint, and the treatment is identical with that already outlined for fractures of the femoral condyle.

Fractures of the spine of the tibia, associated with rupture of the crucial ligaments, are not very uncommon. Jones mentions 25 cases. I have seen them from time to time at Mercer's Hospital as the result of severe violence. In one case the tibia was completely dislocated backwards. The knee-joint is immobilised in plaster of Paris, and neither active nor passive movements allowed until two months have elapsed. Then very gradual and gentle movements are allowed. A Thomas walking calliper may be substituted for plaster fixation. If, following this treatment, movements are restricted as a result of a bony block produced by a detached spine uniting by callus, the knee-joint must be exposed by longitudinal division of the patella, and the bony block removed.

OSGOOD'S OR SCHLATTER'S DISEASE.

The condition is sometimes spoken of as "Rugby knee." Pain and tenderness rapidly disappear under rest treatment, and a knee cage should be worn limiting flexion of the knee and the activities of the patient for some months. The epiphyseal strain may exist without much difference between the X ray appearance of the normal and abnormal bone.

FRACTURES OF THE TIBIA AND FIBULA (UPPER THIRD).

These injuries have received but scant attention, owing to the ease with which treatment can be carried out. The treatment is identical with that of fractures of the condyles of the femur, and consists in manipulating the fragments, while an assistant is fixing the extension tapes to the end of a Thomas splint. Loops

of bandages are applied to control any lateral or antero-posterior deviations.

FRACTURES OF THE LOWER THIRD.

It is when we come to the common broken leg, that is to say, an oblique or spiral fracture of the lower end of the tibia, with a fracture of the fibula at a slightly higher level, that real difficulties in conservative treatment arise. Fractures of the tibia alone, or of the fibula alone, are already splinted by the uninjured bone. A little extension and manipulation will easily correct any slight displacement, and the limb can be encased in plaster of Paris from the foot to above the knee. At the end of six weeks, weight may be borne on a walking calliper.

Fracture of the fibula alone, without displacement of the foot, is only of interest because the diagnosis may be missed. Special attention should be paid to the ecchymosis which appears some time after the injury, and often extends up along the line of the fibula. The same ecchymosis arises in all fractures, including fractures of the base of the skull. In doubtful cases of fracture of the long bones without displacement, ecchymosis following the line of a bone should put the practitioner on guard. If extensive ecchymosis coexists with a point of maximum tenderness, a fracture is almost certainly present.

These remarks apply to fractures of the fibula, both in its upper and lower thirds.

Walking may be allowed when it is possible to do so without causing pain. No form of splintage is necessary. When the fracture is near the ankle-joint it is wise to wear an outside iron, or to raise the inner side of the boot, so as to anticipate any possibility of valgus deformity occurring under the strain of weight-bearing.

Treatment of Fractures of the Lower Third of the Tibia and Fibula.

With the oblique and spiral fracture I have had more difficulty and seen more bad results than in any other fracture of the lower limb. Anyone with experience in setting these fractures knows that manual extension of the foot is very unsatisfactory. If it is a recent case, and it is decided to fix the limb in plaster from the foot to well above the knee, the hands of the assistant get in the way at every turn of the lower part of the bandage, and displacements occur. It is impossible for an assistant to keep up sufficient extension and to keep the fragments in alignment during the application and setting of the plaster in a difficult case. On the other hand, there is not sufficient of the limb below the fracture to apply adhesive strapping for fixation to the end of a Thomas splint.

Sinclair's foot-piece and glue, as a means of putting extension on the lower fragments, has given satisfaction to many surgeons, but, after failures by this and other methods, I have adopted the following plans sometimes singly and sometimes in combination.

1. In certain cases, with the patient under an anæsthetic, and the knee held flexed by an assistant, extension and manipulation of the foot readily reduces the shortening, and corrects the alignment. If steadily held, there is no great tendency to recurrent displacement of the fragments, and the assistant experiences little difficulty while the limb is immobilised in plaster.

2. The deformity can only be reduced with difficulty, and the slightest move of the foot brings about slipping of the fragments. In such cases the sectional plaster of Paris method, as recommended by Cockerill, is useful. (Fig. 3.) I have a case so treated at present in Mercer's Hospital. By the sectional plaster method is meant that separate plaster casings are applied and allowed to set above and below the injury. The injured area remains exposed and free for manipulation. The first section of plaster should be applied from just above the fracture to the middle of the thigh, with the knee slightly flexed. The second plaster encases the foot. The two sections are allowed to set, and the plaster is trimmed at the edges. The foot is now fully dorsiflexed in slight inversion by the assistant, while the surgeon unites the two plasters by a few turns of a third plaster bandage. If more extension is required than can be obtained comfortably by manual traction, a clove hitch is placed round the foot encased in its plaster and attached

to the gates (see Lectures I. and II.), or pulled upon by means of a block and tackle arrangement. The two plasters are then united as before.

3. When more than manual traction is necessary, the clove hitch over the plastered foot is a somewhat clumsy, though effectual, method of reduction. It is better, I think, to pass a long nail under the tendo Achillis in contact with the os calcis, and connect this through the medium of a wire hoop to the end of the gates, so that forcible extension may be applied. The surgeon simultaneously manipulates the fragments into position, and takes care to pull the heel well forward. There is now no difficulty whatever in applying plaster of Paris, and the extension is not released until the plaster is set. The pin and wire stoop are partially encased in

FIG. 3.



Sectional plaster of Paris in the treatment of fractures of the lower third of the leg.

the hoop of wire is fixed tightly to the end of a Thomas splint until the patient is back in bed. This fixed extension may be continued, but in these cases heavy weight-and-pulley extension is better through the medium of the nail—the Thomas splint merely acting as a sling. It is best to pass the nail obliquely through the os calcis on a slightly higher level on the outer side, so that as traction is employed the tendency is slightly to invert the foot. (Fig. 4.)

5. Operation with internal fixation should be the last resort. Probably the best way of securing the fragments is by means of Parham's bands.

Quite often after open reduction no fixation will be found necessary, and the treatment can be continued by any of the methods mentioned above.

POTT'S FRACTURE.

The original description of Pott's fracture, as given in 1768, has been quoted recently by Sir D'Arcy Power, and is well worth reading. To this day Pott's fracture, in the wards of the big hospitals, constitutes a favourite subject for discourse to students, yet the treatment and the results are far from being universally satisfactory. It is the old story: Want of proper reduction at the time of the injury and want of precautionary measures to prevent displacement when weight-bearing is permitted.

The fracture is produced by violent eversion. The astragalus is thrown against the external malleolus. The ligaments binding the fibula to the tibia remain intact and act as a fulcrum, and the shaft of the fibula breaks at the weakest point near the ankle. The importance of the fracture lies in the fact that the astragalus is displaced outwards, perhaps half-way across the articular surfaces of the tibia as well as backwards. The thrust of the foot, if the deformity is not corrected, is between the tibia and the fibula, and not squarely on the tibia. The backward displacement prevents dorsiflexion of the foot, by the contact of the neck of the astragalus with the anterior edge of the tibia.

A patient with an improperly reduced Pott's fracture can never walk without pain in the ankle and pain on the inner side of the knee with a tendency to knock-knee. The distortion outwards of the foot leads to a condition of flat-foot, a further addition to the misery of the patient. If there is much displacement outwards of the foot, the internal malleolus or the internal lateral ligament must, of necessity, be

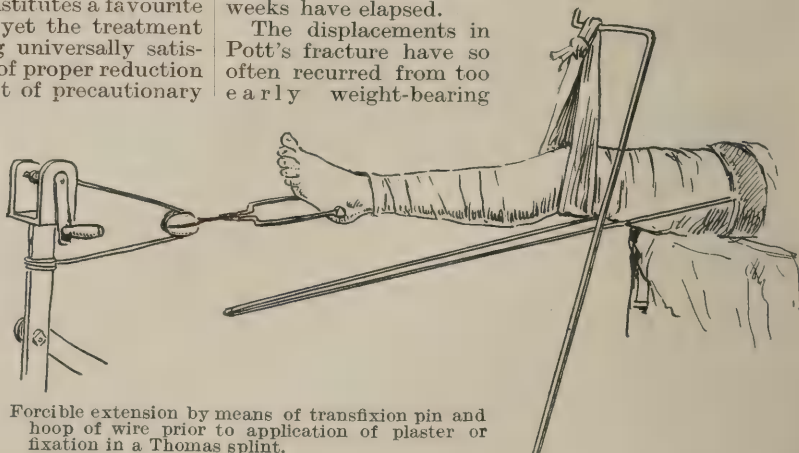
torn. Pott's fracture may be transformed into a Dupuytren's fracture by forcing the astragalus up between the tibia and the fibula. The astragalus may carry with it a portion of the articular surface of the tibia; a piece may be knocked off the anterior portion of the tibia and block dorsiflexion, or a portion of the back of the tibia may accompany the backward dislocation of the foot. (Figs. 5 and 6.)

Whatever the complications the treatment is the same. Under an anæsthetic the outward and backward displacements must be reduced. As in fractures of the lower third of the tibia and fibula, relaxation of the tendo Achillis by flexing the knee is an advisable preliminary. The foot is then forcibly twisted inwards in order to bring the astragalus squarely under the articular surface of the tibia, and at the same time the heel is pulled steadily forward until the foot can be dorsiflexed with ease beyond a right angle. The foot must be maintained in this position of dorsiflexion and exaggerated inversion.

The displacement does not readily recur after reduction, and any form of splint intelligently applied will secure fixation. A board or gutter splint secured to the outer side of the leg and well padded at the lower extremity will, by a thrust, keep the foot inwards. Dupuytren's splint and Syme's splint are still employed. Plaster of Paris in a recent case is an admirable means of fixation. It should extend—as in fractures of the lower third of the leg—from the foot to above the knee. It is best to make two plaster splints composed of several folds of superimposed bandage. One strip is made into a posterior splint, which extends from the toes along the sole, round the back of the heel, and up beyond the knee-joint behind. The other strip is moulded in position while the foot is held in inversion, and extends from the external malleolus over the dorsum of the foot to the inner side under the sole, and upwards along the outer side of the leg to the same height as the posterior splint. The posterior splint is applied first, and both are secured in position by a roller plaster bandage. The foot must be held in the correct position during the setting of the plaster of Paris. They can be easily removed in about three weeks for massage and movements, but should be reapplied in the intervals until another three weeks have elapsed.

The displacements in Pott's fracture have so often recurred from too early weight-bearing

FIG. 4.



Forcible extension by means of transfixion pin and hoop of wire prior to application of plaster or fixation in a Thomas splint.

that it is best to prohibit walking for at least two months from the original injury, and before walking is allowed the inner side of the heel and sole of the boot should be raised so as to maintain a slight varus position.

In dealing with patients who are not helpful, or in heavy subjects, it is wise to prescribe an outside iron and an inside cross strap, so as to ensure support and inversion. I will describe three cases, but I have had many, in which the patient was treated accurately while in hospital, but when weight-bearing was resumed the callus was not strong enough to bear the strain, and the patient returned with pain and disability

consequent on gradual yielding in the direction of the original displacement. It is important to know what to do in cases which have been allowed to walk

operation, when a portion of the tibia, either in front or behind, is torn off and mechanically blocks the movements of the ankle-joint, but in cases seen early forcible manipulation will usually secure a right-of-way in every direction.

FIG. 5.



Fracture of fibula with portion of tibia detached and blocking dorsiflexion.

four or five weeks after the accident without support and who come back suffering from pain and a valgus deformity.

CASE 1.—The patient was a big, heavy woman, who refused to stay in hospital more than a week. The displacements were reduced, and the foot put in plaster of Paris. She commenced weight-bearing at the end of a month, and then returned to the extern department of the hospital, with pain and some slight eversion and tenderness at the site of fracture. An X ray photograph showed no displacement. The boot was raised on the inner side, and an outside iron fitted so that the foot was well inverted. In this case, a recurrence of the deformity was anticipated and prevented.

CASE 2, a private patient, came for advice seven weeks after her accident. The fracture was reduced correctly by her local doctors, but she began to walk without permission and without support after the lapse of a month. An X ray photograph showed the astragalus displaced outwards and somewhat backwards. The patient was anaesthetised, and thorough wrenching in an inward and forward direction was carried out with a Thomas wrench. This procedure did not appear to bring the foot satisfactorily into position, and an osteotomy of the fibula was done. Further wrenching after the osteotomy completely corrected the displacement. Three weeks later she was discharged in a light plaster case, and shortly afterwards was fitted with an outside iron and a crooked heel. Her progress was quite satisfactory.

CASE 3.—This patient came back a year after recurrence of the displacement. The fibula was divided, and a cuneiform osteotomy performed on the inner side of the tibia, after the method of Jones, so that inversion of the foot could be obtained and the weight thrown on the outer side of the foot without making any attempt to reconstruct the joint.

This simple form of osteotomy has given me good results. I have never undertaken the reconstruction of the fracture, as recommended by Murphy and others.

The patient is seldom quite well and free from pain after a Pott's fracture in less than six months. It may sometimes be necessary to do an open

FRACTURE OF THE ASTRAGALUS.

Sometimes from heavy falls on the feet the astragalus may break instead of the tibia and fibula. There is often an irregular comminution of the body, or the neck may be fractured, and to all intents and purposes the latter fracture is outside the ankle joint. Forward dislocation of a fractured astragalus can be reduced by traction on the foot, and, if necessary, the tendo Achillis is divided in order to pull the os calcis away from the tibia. In some cases the fractured bone gets so twisted and displaced that astragalectomy becomes necessary. In cases of fracture of the neck, as distinct from fractures of the body, there is usually little displacement, and treatment should consist in placing the foot in full dorsiflexion in plaster of Paris for three weeks. Weight-bearing should not be allowed for two months.

Sometimes a little ossicle of bone, described by Pirie, is seen between the astragalus and scaphoid as if detached by an injury; a comparison with the sound side will sometimes show a similar condition. The recognition of "Pirie's ossicle" is of medico-legal importance; it is not the result of injury.

Thurstan Holland, in the *Journal of Anatomy*, July, 1921, deals with the significance of this ossicle.

FRACTURE OF THE OS CALCIS.

The bone may be torn by muscular action at the point of insertion of the tendo Achillis. It may be crushed, fractured transversely or longitudinally, and may be associated with fracture of

FIG. 6.



Fracture reduced and treated in plaster of Paris.

the astragalus. Complete plantar flexion of the foot may be needed to bring the fragments well into position and to take the pull of the tendo Achillis

from the posterior fragment. A traumatic flat-foot often results from unreduced fracture of the os calcis or astragalus.

The treatment in the first instance should anticipate this possibility, and after attempted reduction the foot should be placed in slight inversion.

Fractures of the os calcis give unsatisfactory results, a painful heel often persisting whatever treatment is adopted. The treatment of this unsatisfactory late result was discussed by Cotton in "Annals of Surgery," 1921. He regarded it as being due chiefly to excessive new bone formation on the outer side locking the fibula to the os calcis, and he recommended a U-shaped incision under the external malleolus, the turning up of a subperiosteal flap, and a wide removal of bone in this area.

FRACTURES OF THE SCAPHOID.

Bennett described two examples of fractures of the scaphoid bone of the foot in 1884. The articular surface which receives the head of the astragalus presented lines of ununited fracture, but on the opposite surface—in contact with the cuneiform bone—the lines of fracture were quite indistinct.

Thurstan Holland draws attention to the presence of a distinct skeletal bone situated at the posterior external side of the tuberosity of the scaphoid which has been mistaken, after injury, for a fracture of the tuberosity of the scaphoid. To assist in the diagnosis, the other foot should always be examined. The bone is usually known as the "tibiale externum."

FRACTURE OF THE METATARSAL BONES.

Fracture of the metatarsal bones usually causes flattening of the transverse metatarsal arch. Treatment is directed to restoring this and maintaining fixation for some weeks. A pad should be applied in the cavity of the arch, and the latter kept in position by a circle of adhesive strapping. To prevent metatarsalgia, weight can be prevented from falling on the fractured bone by a transverse metatarsal bar across the sole of the boot. It must be remembered that a small portion of the base of the fifth metatarsal bone may be detached normally and remain as a separate bone throughout life—"the bone of Vesalius"; it appears in an X ray photograph as if a fracture.

FRACTURE OF THE SESAMOID BONES.

The sesamoid bones must not be forgotten. Cases have been reported by Hall Edwards, by Scales, and by Muller, which were operated upon and the diagnosis of fracture confirmed. Kellogg Speed lays great stress on these injuries, and says they are usually due to a heavy object falling on the foot, or sudden increase in weight-bearing force when carrying heavy objects.

Physical examination reveals little, but by finding persistent tenderness under the head of the first metatarsal, the possibility of this fracture should be considered. Out of five cases, four were found to be fractures of the internal sesamoid, which is more distinctly in relation to the head of the metatarsal bone. The best treatment is removal by operation.

Thurstan Holland states that, developmentally, the inner sesamoid may be in two, three, or even four separate bony pieces. Many times, says Holland, such a bone has been described as fractured when there has been a history of injury, but, in his experience, fracture must be a very rare occurrence, and most of the so-called fractures are really nothing of the kind. Comparison should be made with the other foot. In the same paper, he reminds the surgeon of the bone of Vesalius, referred to above, which is probably a persistent epiphysis, part of the spur-like process at the base of the fifth metatarsal bone. At first sight it looks like a chip of bone separated as a result of injury.

OPERATIVE TREATMENT OF FRACTURES.

In these lectures I have confined my remarks to the conservative treatment of fractures, but operation may be part of the conservative treatment, and in a number of cases, especially when necessary appliances are not available, the displacement of fractured

extremities may be reduced without internal fixation by open operation. Afterwards the treatment along conservative lines is continued.

In very few cases within recent years have I found it necessary to apply plates, screws, metal bands, or bone grafts.

I think the internal fixation of fragments with foreign bodies served a useful purpose during a period when splints, such as Liston's splint, Cline's splint, and MacIntyre's splint were the best known to surgery, and were often responsible for deplorable results. During this period neither traction nor suspension was generally understood. I think plates and screws have done the same service in the surgery of fractures as Murphy's button has done in the case of intestinal surgery, at a time when the technique of suture of the intestines was in its infancy. The work of Sir Arbuthnot Lane, and others of the same school, has been an immense impetus to those working for better results in the treatment of fractures, and I believe it will go down to history as an important landmark in the march of surgery.

It appears to me that the time has arrived when the routine operative treatment of recent fractures must be regarded as a confession of failure—a confession that the surgeon is unable, by manipulative methods, to reduce deformity and to keep deformity reduced until a first-rate functional result is assured. Imagination and skill are more often required in the non-operative than in the operative method of treatment. The management of a case for the first three or four weeks requires constant and minute attention, but these disadvantages must be offset against the very real dangers in connexion with operation, especially in the case of fracture of the femur. Even assuming the most perfect surgical technique, delayed union, non-union, delayed infection, perhaps through the blood stream, may take place, and the treatment of fractures so complicated must be commenced de novo under the most unsatisfactory conditions. I speak only of recent fractures. If conservative treatment is not successful in the first instance, a new beginning can usually be made with a bright outlook, provided too long an interval of time is not wasted before the surgeon sees the error of his ways.

The wave of thought in favour of operative treatment of fractures during the decade prior to the war was due to faulty teaching in orthopaedic methods. Every student was taught with minute accuracy how to reduce dislocations. No surgeon ever dreamt, unless under very exceptional circumstances, of reducing dislocations by open operation. It was different in the case of fractures. I can remember quite well how minutely I was taught the mechanism of the displacement of the fragments in the case of fractures, and when that aspect of the injury was completed, the teachers and the text-books went straight on to a detailed description of a multitudinous variety of splints and the methods of their application. There was hardly an intelligent sentence in reference to the all-important subject of reduction.

It is on reduction of displacements and the attainment of a perfect alignment that union and a good functional result depend. I can give no better example of this than fracture of the neck of the femur. It was no wonder that a rising generation of surgeons before the war determined that by some means or another alignment and reduction must be assured, and in an aseptic era the easiest method appeared to be open operation.

The war has come and gone, and we know that by non-operative methods we should be able in the great majority of cases to attain perfect alignment and a perfect functional result free of risk, immediate and remote. To this day there are cases, few and far between, where a Murphy's button is of use in intestinal surgery, and so occasionally operation will be needed in a surgeon's practice. In the realm of fractures there still remain the patella, the olecranon, and a rapidly decreasing number of the oblique fractures of the lower third of the tibia and fibula, which may defeat all efforts at conservative treatment.

ON THE EXPERIMENTAL TREATMENT OF
IMPLANTED MALIGNANT TUMOURS OF
THE RAT.

BY THOMAS LUMSDEN, M.D. ABERD.

(From the Department of Experimental Pathology,
Lister Institute.)

In a previous communication¹ the effects of an antiserum upon cancer cells, growing in vitro, were detailed. It was shown that if 1-2 g. of finely divided mouse carcinoma (M. 63, Imperial Cancer Research Laboratory) were injected into the peritoneal cavity of a rat or rabbit weekly for two to three months, a concentration of antibodies, sufficient to kill cancer cells in vitro within a few minutes, was obtainable in the serum of the rat or rabbit. If mouse heart muscle, spleen, kidney, or salivary gland were grown on the same slide as a fragment of mouse cancer, an application of the antiserum, which killed the cancer cells rapidly, did not seriously damage the normal mouse tissues. Thus a fragment of heart muscle might beat and grow in the antiserum for four or five days, after the death of the cancer cells cultured alongside of it. Since the above facts were published they have been confirmed more than 200 times, and no single instance has been observed in which cancer or sarcoma cells could survive in an antiserum made as above directed.

The object of the experiments now reported was to determine whether comparable results could be obtained in the living cancerous or sarcomatous animal.

Experimental.

The tumours employed were the mouse carcinoma (M. 63 of the Imperial Cancer Research Laboratory) and Jensen's rat sarcoma. In most cases the sarcoma was used because it was found that while M. 63 is very satisfactory for in vitro work, it is less suitable for experiments in vivo. It is a hæmorrhagic tumour and tends to degenerate readily, so that when it attains a considerable size it consists of an actively growing shell surrounding a central mass of degenerate tissue. Its hæmorrhagic nature made it almost impossible to obtain an antiserum which did not contain a large amount of agglutinins and lysins for mouse red blood corpuscles, which naturally increased its toxicity. These could be absorbed, but the serum obtained from one rabbit might require the corpuscles of several dozen mice for its complete absorption. Jensen's rat sarcoma, on the other hand, grows freely and, even when it attains large proportions, consists of a mass of healthy malignant cells with a minimum of stroma and free from hæmorrhages. Central degeneration sets in very late, and although this tumour, like all others, may occasionally absorb before it gets a firm footing, it practically never does so when well established, say, in the flank of a healthy young rat. Thus, with the precautions taken in the following experiments, out of considerably over 100 tumours of the foot only two absorbed spontaneously, and of over 400 established tumours of the flank or back in young rats I have not seen one example of unaided recovery.

*A. Infectivity of Cancer Cells Previously Treated
with Antiserum.*

In order to determine whether cancer cells treated with antiserum in vitro were capable of producing a progressive tumour in vivo the following experiment was undertaken. Mouse carcinomata were removed aseptically and the healthy portions finely divided up with scissors. Of this material about 1 g. was transferred to a heavy watch glass and 5 c.cm. of normal rabbit serum was added. To a similar amount of the tumour tissue in another watch glass 5 c.cm. of antiserum was applied. The watch glasses were

covered with glass plates, and sealed with vaseline to prevent evaporation. They were then placed in an incubator at 37° C. for periods varying from three to six days. In other instances the fragments of cancer to be used for inoculation were cultured separately by the ordinary hollow slide and cover-glass method, in normal rabbit serum, or in antiserum from an immunised rabbit. The results of these two methods were exactly similar and may be given together.

Of 15 mice inoculated with cancer cells cultured in normal serum for from three to seven days, seven developed progressive tumours—i.e., 46·6 per cent. Of 20 mice inoculated with cancer cells kept for three to six days in antiserum not one developed a progressive growth; in all cases, however, an inflammatory reaction was seen at the site of injection which passed off in seven to ten days. It appeared then that the antiserum had so damaged the cancer cells that they were unable to infect when inoculated into normal mice or else the immunity induced by the absorption of the attenuated cells was sufficient to prevent tumour formation.

*B. Investigations of the Curative Effects of
Antiserum in Vivo.*

The antisera are definitely toxic and irritant; thus it was found that 0·25 c.cm. of unabsorbed M. 63 antiserum when injected into the tail vein might kill a 25 g. mouse within 10 to 30 minutes. If the antiserum were fully absorbed with mouse red blood corpuscles then 0·4 or 0·5 c.cm. might sometimes be safely given. When a fatal dose is injected, intense dyspnoea and collapse come on within five minutes, and post-mortem examination invariably shows the presence of acute cedema and congestion of the lungs. Similar results were obtained with Jensen's sarcoma antisera.

Experiments with Jensen's Rat Sarcoma.—The antisera produced as described were obtained from rabbits which had been inoculated weekly from 8 to 16 times with from 1-2 g. of minced Jensen's rat sarcoma. In all cases the sera were tested on healthy growing cultures of Jensen's rat sarcoma in vitro, and invariably cytotoxicity was observed. It was, however, only after prolonged inoculation that the rabbits gave a highly specific serum. The antisera were tested in sarcomatous rats in the following ways.

1. By injection into the tail vein. As in cancerous mice no curative effect was consistently noticed.

2. Subcutaneously at a point remote from the tumour. This was without benefit. In 1908 Walker² reported that in a batch of ten mice treated with subcutaneous injections of an antiserum, the tumours in seven dried up and came away as small scabs. He does not state whether recurrence took place. With the tumours I have employed and using a slightly different technique, I have never obtained satisfactory results.

3. By injection into a tumour of the flank. When the growth was small some amelioration resulted. Out of six rats so treated only one completely recovered. In the case of large tumours gangrene or sloughing may follow such inoculations, but recurrence almost invariably takes place in the ulcerated area so produced.

These unpropitious results were so unlike the invariably lethal effects obtained on the tumour cells in vitro that it was suspected that the antiserum could not have come into intimate contact with the cells in adequate concentration for a sufficient period. An attempt was therefore made (it would be easy in man or any other large animal) to inject the antiserum into the artery going to the affected area and to close the corresponding veins. Even in a large rat this was found to be impracticable on account of the small size of the blood-vessels.

For this reason in the last 100 experiments the following technique was adopted. Rats were inoculated with Jensen's rat sarcoma in either the right foot alone or in both feet, and after two to three

¹ THE LANCET, Feb. 21st, 1925.² THE LANCET, Sept. 12th, 1908.

weeks when the tumours were well established and had attained the size of a green pea (Fig. 1, A) the antiserum was injected into and around the tumour. In most cases before the injection a rubber band was applied round the ankle and the constriction was so graded as to just completely shut off the blood circulation. The purpose of the constriction was to maintain around the tumour a high concentration of the antiserum for an appropriate period. It was found that by means of this manoeuvre definitely curative results could always be obtained.

After many trials of different doses of antiserum and varying degrees and duration of constriction, the most effective procedure was found to be as follows. Immediately after applying the rubber band 0.2 c.cm. of antiserum was injected into the tumour, after 15 minutes a further dose was given, and an hour later a third and final injection of 0.2 c.cm. was made. The rubber band was removed after two to three hours from the time of its application. When this was done and repeated in a day or two if the tumour still looked active, in the great majority of cases the tumour disappeared though sometimes, when the growth was large, some loss of normal tissue also occurred. After removal of the constricting band the foot rapidly swelled, and not infrequently some hæmorrhage into the tumour took place. Within three to four days the growth became inactive, either gradually absorbing or forming a brown or blackish crust which separated after 10-14 days, leaving a small healthy scar (Fig. 1, B and C). No instance of recurrence after complete healing has been seen.

In four animals cure was effected without constricting the limb. In this case a preliminary inoculation caused—as it invariably does—inflammatory oedema within five to ten minutes. Into this oedematous area a second and later a third inoculation was made 15 and 60 minutes after the first. In six other animals so treated the tumour continued to grow, and cure was only effected after antiserum with constriction.

The actual results in the last 50 animals treated and the controls employed were as follows:—

Animals treated	50
J.R.S., of foot 46; of tail 4.	
Animals cured	41
Without serious loss of normal tissue, 35 (foot 33, tail 2); with loss of foot 4, of tail 2.	
Animals not cured	9
Tumours of right foot very large, 2; ulcerated, 2; without constriction, 2. Coexisting large tumour of back, 3.	
Control animals (8 recovered)	50
Tumour of foot—spontaneously, 1; of tail after constriction + nor. ser., 3; of foot after constriction + nor. ser., 2; of foot after constriction + AqNo ₃ (5 per cent.), 1; of foot after constriction antiplatelet serum, 1.	
Other controls (none of which recovered) ..	42
Constriction and nor. ser., 11; constriction alone, 10; antiplatelet serum and constriction, 2; iodine 0.3 per cent. + constriction, 2; untreated, 16; constriction and AqNo ₃ (5 per cent.), 1.	

It will be seen that of animals treated 82 per cent. were cured; the 18 per cent. uncured included large or ulcerating tumours in which the antiserum escaped when injected. Of the controls 2 per cent. recovered spontaneously, a further 14 per cent. recovered after control treatment of various sorts, 84 per cent. produced progressive tumours. It was noticed that antisera in which the hæmolysins and agglutinins had been absorbed, though only about half as toxic, were rather more effective against the sarcoma than the unabsorbed antisera.

It must be appreciated that convincing results are only to be attained after very considerable experience and with careful attention to certain essential details. It may be of value here to specify the precautions which are necessary to that end.

1. A potent and specific antiserum must be obtained. This should be tested upon cultures of Jensen's rat sarcoma in vitro before use.

2. The investigator must acquire experience sufficient to enable him to grade the constriction so as not to cause destruction of the foot, and to apply, and if necessary re-apply, the serum in appropriate dose.

3. The antiserum must be sterile, for septicity invalidates the results. If a large septic ulcerating area exists, discharge escapes, and there may not be sufficient absorption from the dying cells to evoke immunity.

4. Only healthy young rats (six weeks to six months) and a vigorous strain of tumour must be used, otherwise the controls might not grow with certainty. In any single experiment the animals should be as far as possible similar in age, breed, &c.

5. Treatment should be begun only when all the tumours are well established and about the size of a green pea.

6. The controls should, as a rule, be equal in number to the cases treated.

C. Immunity after Cure by Antiserum.

Bashford, Murray, Haaland,³ and others have shown that if an animal spontaneously recovers from any particular inoculated tumour it is in future immune thereto. In order to discover whether a similar immunity followed the disappearance of growths after treatment by antiserum + constriction, all the animals which had recovered from sarcoma of the right foot and those which had not been cured were from four to nine weeks after the original implantation inoculated with a fresh graft of Jensen's rat sarcoma in the left foot. All were injected on the same day and with the same tumour material and dose. In all cases a tumour appeared and increased in size for seven to ten days, but thereafter, in those animals in which antiserum treatment had cured a tumour of the right foot, the tumour of the left foot rapidly disappeared. In the animals in which treatment had failed or had resulted in serious loss of tissue, the tumours implanted in the left foot increased and formed typical progressive sarcomata (Figs. 2 and 3). When examined 14 and 21 days after the test implantation of Jensen's rat sarcoma into the left foot, the following were the results. In 35 animals in which the original tumour was cured without serious loss of tissue, 35 were apparently immune—i.e., no tumour developed on the left foot. In six animals with loss of the foot or tail as the result of treatment of the original sarcoma, six proved to be not immune—i.e., a progressive tumour developed on the left foot (Fig. 2). In nine animals in which treatment of the right foot tumour was unsuccessful eight were not immune—i.e., tumour developed on the left foot; one was apparently immune—i.e., the implant in the left foot did not develop.

It will thus be seen that after cure of the tumour of the right foot or tail, by means of antiserum and constriction, the proportion of animals showing general immunity, as evidenced by failure of inoculations of Jensen's rat sarcoma into the left foot, and later into the right axilla, reaches 100 per cent. While if absorption of products from the original tumour was prevented by separation of the extremity no immunity resulted (Fig. 2).

D. The Effect Produced on a Jensen's Rat Sarcoma Tumour of One Foot, by Treating with Antiserum a Similar Growth of the Other Foot, both Tumours having been Implanted at the Same Time.

From a number of rats inoculated with Jensen's rat sarcoma in both feet at the same time, 14 in which the tumours had become well established were selected. Of these, five which bore the smaller tumours were retained as controls. In the other nine rats, the tumours on the right foot only, were treated by antiserum + constriction. The experiment was somewhat interfered with by an epidemic of enteritis, but the following results were obtained:—

Tumours of right foot, treated, 9; cured, 9. Controls untreated, 5. Progressive growth, 5.

Tumours of left foot in surviving treated rats, 7; disappeared, 5. (Fig. 4.) In control rats, 5; progressive growth, 5. (Fig. 5.)

³ Third Scientific Report, Imp. Canc. Res. Fund.

FIG. 1.

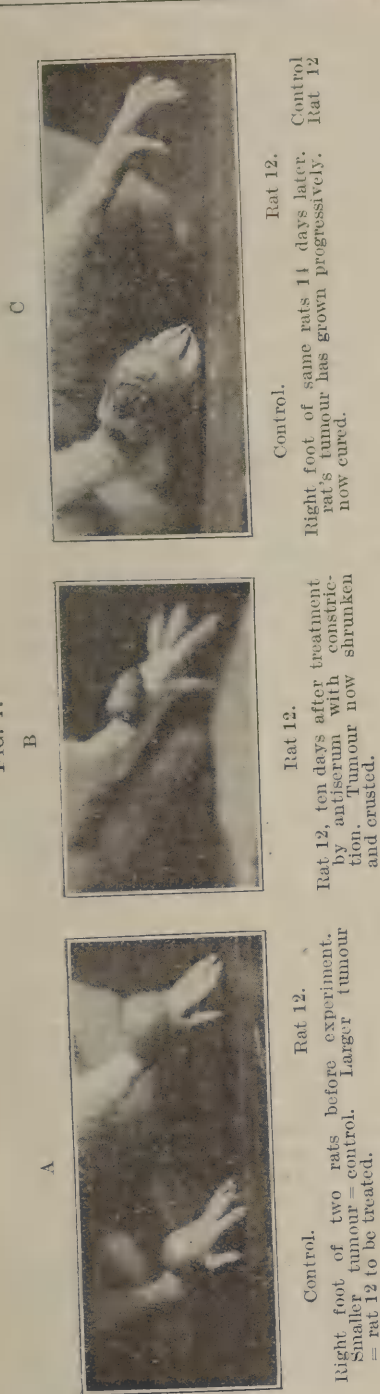


FIG. 4.

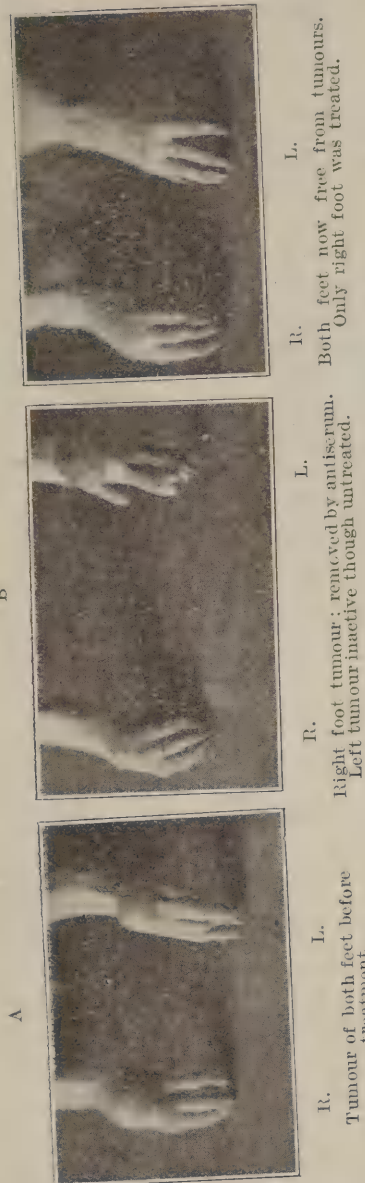
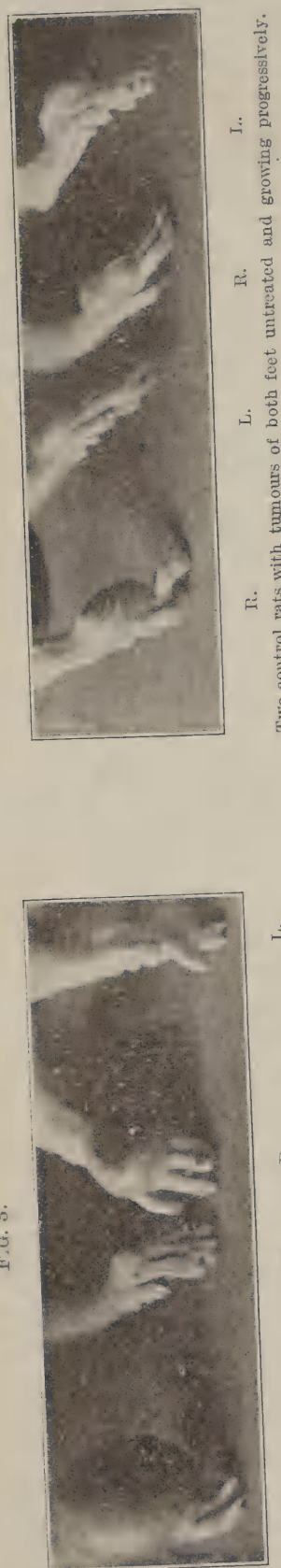


FIG. 5.



Two of the treated rats died of enteritis after cure of the right foot though before the left foot tumours, which had begun to absorb, had time to disappear. But even discounting these, the results show: Of seven surviving treated rats, in all the right (treated) foot is cured, in five the left (untreated) foot is also cured (Fig. 4). Of the two remaining left foot tumours, one is retrogressing and will almost certainly disappear, one still looks active. All the ten tumours in the control rats grew progressively (Fig. 5).

Discussion.

From observation of the action of antiserum on cancer fragments *in vitro* the following facts emerge.

1. Malignant cells which have migrated out from the fragment are killed, in a few minutes they cease to move, and the fine fatty granules become irregular in shape and clump together. The nucleus shrinks leaving a transparent ring around it, and the same is true of the granular cell cytoplasm. Later cytolysis occurs and the bodies of the cells become invisible unless stained and are represented only by an irregular mass of protoplasmic debris surrounded by a few large fatty globules.

2. The antibodies diffuse very slowly into the solid fragment of cancer, so that living cells can still be seen in the centre of the fragment even one or two days after antiserum has been applied to it.

If the culture is now fed with normal serum a few cells may again migrate out into the medium. A second application of antiserum may be required in order to kill the whole of the malignant tissue.

The poor diffusibility of the antiserum partly explains why it acts so inefficiently when injected without coincident constriction directly into a tumour *in vivo*. A further cause of failure is that without stoppage of the circulation in the tumour area, a high concentration of the antiserum cannot be attained locally. When injected into a sarcoma the antiserum forces a passage through the compact mass of malignant cells reaching lymph and blood spaces, from which it is absorbed very rapidly into the general circulation. This is shown by the fact that when a lethal dose of antiserum is injected into a tumour of the back death may ensue almost as rapidly (15-30 minutes) as when a fatal dose is run into the tail vein. The causes of failure when antiserum is injected into the peritoneum, the subcutaneous tissues, or intravenously are probably these: (a) The antiserum is diluted with the whole of the body fluids before reaching the tumour. (b) When the antibodies have entered the blood-vessels there is some difficulty in their leaving these again. (c) The inoculated animals appear to have some means of resisting or neutralising the foreign antibodies, for it is found that they tolerate without ill-effects a larger dose the second time they are inoculated. (d) There is some evidence that the antibodies are absorbed by a large new growth when present. Thus it was found more difficult to cure a tumour of the foot when there was in the same animal a large sarcoma of the back.

It is probably because most of the above points were overlooked that the many antisera heretofore used for the treatment of cancer in this country, and especially abroad, have invariably given disappointing results. I suggest that antisera to be directly effective in man ought to be injected into the arteries supplying the tumour area, and the corresponding veins and lymphatics should be tied or compressed.

The reason why sarcomata treated by constriction and injections of antiserum disappear, raises some points for discussion, but clearly the most important thing is the fact that these tumours can thus be got rid of practically at will, and that thereafter the rats dealt with are immune to the tumour concerned.

The possible factors causing the disappearance are: (1) Temporary stoppage of circulation. (2) Consequent retention of a high concentration in the tumour and its vicinity of antiserum injected therein, (a) acting as a non-specific irritant, (b) acting specifically on the sarcoma cells.

The controls make it abundantly evident that constriction as such alone plays, at most, a subsidiary part, for of ten animals so treated not one recovered. It is not so clear that constriction plus some non-specific irritant or some mechanical destruction of the tumour cells is equally ineffective. For of three rats treated with an anti-rat platelet serum kindly given me by Dr. S. P. Bedson, all showed very severe hæmorrhages into and around the tumours. One recovered and proved immune, two were not cured. When normal serum is inoculated several times into a tumour with coincident constriction recovery sometimes takes place; here it is possible that enough damage has been done mechanically to cause retrogression of the tumour. Two sarcomata of the foot and three of the tail disappeared after such treatment, while 11 continued to grow. In passing, it may be remarked that the tail is not a satisfactory site for experimental purposes since spontaneous absorption frequently happens in sarcomata in this situation.

On the whole, it seems probable that the specific cytolytins proved *in vitro* to be present in the antiserum are the main factor in the recoveries reported above. The fact that a fair proportion of cures follows the repeated injection of antiserum even without coincident constriction favours this view. The selective way in which the tumour was in most cases removed points in the same direction. In about 60 per cent. the growth retrogressed after antiserum and constriction, without apparent loss of any normal tissue; even the skin over the tumour survived, although in some cases tightly stretched and thinned out over a large growth. In most of the other cases of recovery a brown or blackish crust formed (Fig. 1, B) over the tumour area, and when this fell off 7 to 14 days later, a neat scar was left. In these cases just referred to no discharge escaped, so that all products of destruction from the tumour were absorbed into the general system. Such absorption, I think, necessary if immunity is to supervene, and this explains why no immunity takes place when the tumour is removed surgically, when the limb becomes immediately gangrenous, or when a discharging septic wound or ulcer results from treatment.

The following seems to me to be the sequence of events: (1) When the antiserum is got into the lymph round the tumour cells and is maintained there for some hours in good concentration it selectively kills many of the malignant cells and damages others. (2) Absorption of the products of degeneration of these cells acts like a vaccine, and calls forth a general active immunity which completes the cure locally, and prevents subsequent grafts from holding.

It may be by absorbing the antibodies thus produced by the animal, that a large Jensen's rat sarcoma of the back renders more difficult the successful treatment of a coexisting tumour of the foot. For a similar reason it is hardly to be expected that absorption of a tumour of the left foot should invariably follow cure of a sarcoma of the right foot. The results may be dependent on the relative size of the tumours, &c.

In estimating the meaning of the above experiments it is to be appreciated that causing the disappearance of an inoculated and more or less encapsulated tumour is a very different thing from curing a spontaneous, invading, and metastasising new growth. It is further noteworthy that the conditions were to some extent favourable for success by reason of the site chosen for inoculation. In spite of these considerations the results do seem to indicate a hopeful line of inquiry.

Looking to the future it is proposed to try whether curative effects can be obtained by frequently repeated inoculation of cells damaged by culture in antiserum or of cells otherwise attenuated. Further, if the virus and specific factor for the existence of which Gye and Barnard have adduced evidence prove to be the veritable cause of cancer, then the antiserum may have other than purely cytolytic effects, and it may be possible to obtain a stronger and more specific

antiserum by using these isolated factors as antigens than by employing the living cancer cells as I have done.

Conclusions.

1. An appropriate antiserum kills cancer or sarcoma cells in vitro, rapidly and invariably. It is much less toxic to the normal tissues than to the malignant cells. 2. Pieces of cancer tissue kept in antiserum for three to six days at 37° C. do not thereafter produce a progressive tumour when inoculated into the living animal. 3. Jensen's rat sarcoma of the foot can be caused to disappear by repeated injections of antiserum into and round the tumour, along with temporary stoppage of circulation in the foot. 4. After such removal of a tumour the rat becomes immune, so that a subsequent inoculation of Jensen's rat sarcoma into the other foot or into the axilla does not hold. 5. When an implanted tumour is growing on each foot, removal of one of these by means of antiserum and constriction is, in a large proportion of cases, followed by absorption of the tumour in the other untreated foot. 6. It is suggested that during absorption of the tumour after treatment with antiserum and constriction, the products absorbed from the attenuated or dying cells evoke a general active immunity which completes the cure and prevents subsequent grafts from holding. Such an antiserum might in this way prevent recurrence of a tumour after incomplete surgical removal.

My grateful thanks are due to Prof. C. J. Martin, F.R.S., for putting a laboratory at the Lister Institute of Preventive Medicine at my disposal and for never-failing help and advice in many directions. I have to thank also the British Empire Cancer Campaign for a grant which has enabled me to continue the experiments above recorded.

A CASE OF CHRONIC NEPHRITIS WITH A POSSIBLE PARATHYROID SYNDROME.

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THE following case seems to us to be worthy of a detailed record, since, as far as we are aware, the findings cannot be paralleled in the literature, and since, in view of certain recent observations of Collip, which will be discussed later, the changes in the chemical composition of the blood are of considerable interest. Some details of the latter have been reported already by one of us¹ in a study of the calcium and phosphate content of the blood in nephritis, but in that communication numerous abnormalities presented by the patient were not touched on, and no clinical details were given.

Record of the Case.

The patient, a man of 37, gave no history of any previous illnesses with the exception of two attacks of enteritis while serving in France. He was admitted to hospital on Nov. 7th, 1922, as a suspected carcinoma of the stomach. He had then suffered from attacks of nausea and vomiting for about six months, attacks which had been increasing in severity during the ten weeks previous to admission, and which had led to considerable loss of weight and strength. The vomiting usually occurred three hours after meals and was not accompanied by any abdominal pain. No hæmatemesis or melæna had been noted; there was a doubtful history of jaundice at the onset. The patient also stated that nocturia and polyuria had been present for some years.

Condition on Admission.—An anæmic, wasted man, showing a fine tremor of the hands; no thyroid enlargement. Pulse

80-90. Arteries moderately thickened; apex beat 4 inches from the mid-line in the fifth space, a faint non-conducted systolic murmur present at the apex. Lungs, abdomen, and central nervous system—nothing abnormal. Urine sp. gr. 1010, acid, faint trace of protein, no sugar; deposit, red blood cells, hyaline and granular casts. The amount of urine passed tends to be excessive, frequently exceeding 2500 c.cm., and occasionally reaching a figure in excess of 4000 c.cm. Wassermann reaction negative.

Test Meal.—Free HCl 0.131, combined HCl 0.164, total 0.295—a result which could be taken as excluding gastric carcinoma.

During his stay in hospital the patient suffered from occasional attacks of vomiting and headache. He was at his worst from Dec. 11th, 1922, onwards, when a considerable degree of circulatory failure accompanied by a stuporous, semi-comatose condition developed. In the absence of an increase in the inorganic phosphate of the plasma uræmia was excluded, and the symptoms were attributed to the cumulative effect of chloretone, which had been administered to check the vomiting, in the absence of efficient renal elimination. With omission of the chloretone the patient slowly recovered. On discharge the patient had gained about a stone in weight, and the general condition had improved, though vomiting was still present on occasion. As will be seen from the accompanying table no improvement had occurred in the renal condition as judged by the urea-concentration test, though the blood-urea had fallen as the result of excessive diuresis.

	Blood urea.	Plasma P. inorganic	Serum calcium.	Serum solids.	Urea-con- centration test.	B.P. systolic.
	mg. per 100 c.cm.					
Nov. 13th, 1922	125	4.8	20.1	10.4	1.5	155
" 20th "	132	5.1	18.5	10.2	1.3	155
" 27th "	126	4.6	16.2	9.4	0.8	160
Dec. 13th "	146	3.4	17.1	8.6	1.2	104
21st "	150	3.5	18.3	8.7	1.2	100
Jan. 1st, 1923	70	3.4	15.6	8.3	1.1	125
" 11th "	48	3.3	13.9	8.4	1.2	125
" 24th "	58	3.6	13.7	8.8	1.1	150
Feb. 16th "	52	3.8	14.0	9.1	1.2	160
March 6th "	46	3.3	14.9	9.4	1.1	154
" 23rd "	55	3.7	16.1	9.7	1.0	160
April 17th "	49	3.2	14.7	9.5	1.0	156

Though on admission the urine showed no sugar, a reducing substance, identified by its osazone as glucose, was present at times from Jan. 21st, 1923, onwards. The amount of sugar present was small, averaging about 0.3 per cent. Tolerance curves to 50 g. of glucose gave the following figures:—

23/1/23. Before: Blood-sugar, 0.100 per cent. After: 30', 0.100; 60', 0.131; 115', 0.125; 135', 0.110.
8/2/23. Before: Blood-sugar, 0.101 per cent. After: 30', 0.105; 60', 0.112; 120', 0.112.

The glycosuria was therefore attributable to a lowered renal threshold. The sugar tolerance appeared to be increased, the highest level met with in the course of the test being below that usually found in the normal. This point cannot, however, be stressed in view of the possibility of impaired absorption in a patient who constantly suffered from nausea.

Electrical reactions were normal. The basal metabolism gave a figure of +26 per cent. (Feb. 9th, 1923). X ray examination showed no evidence of pituitary enlargement or atrophy, no changes in the consistency of the bones, and no arterial calcification.

Owing to a progressive weakness in the voice, the larynx was examined on Jan. 30th, and a complete paralysis of the right recurrent laryngeal was found to be present. The alkaline reserve of the plasma, estimated April 17th, 1923, gave a low normal figure—53 vols. CO₂ per 100 c.cm. of plasma.

The patient died three months after his discharge at Exeter, and no post-mortem examination was performed.

Conclusions.

We have, then, a patient presenting definite evidence of chronic azotæmic nephritis, and in addition an increased basal metabolic rate, a possible increase of sugar tolerance, and a recurrent laryngeal paralysis. Of the chemical findings the most striking is the abnormally high calcium content of the serum. The method employed in estimating the serum

calcium was that of Kramer and Tisdall, a method which is usually accepted as sufficiently accurate for clinical use, and at the time at which these high figures were obtained numerous serum calcium estimations were being made upon other patients, in none of whom was a calcium content in excess of 11 mg. per 100 c.cm. of serum met with. In the individual under consideration the calcium at one time reached a figure of 20 mg.

This extraordinary variation of what is usually one of the most constant constituents of the blood naturally suggests an involvement of the parathyroids. Such an involvement would be of the nature of a hyperplasia, since parathyroidectomy leads to a fall in the serum calcium. Some confirmation of this view is to be found in the literature. MacCollum,² as long ago as 1905, reported a case of parathyroid hyperplasia, in which a tumour 2 cm. in diameter and composed of parathyroid tissue was found below the lower pole of the thyroid; the patient had suffered from a severe chronic nephritis of some years' duration. In another case of advanced chronic nephritis McCollum noted abundant mitoses in the parathyroids. Later Bergstrand³ described hyperplastic enlargement of the parathyroids in ten cases of severe renal disease. None of these patients showed osteoporosis or osteomalacia, but deposits of lime salts were present in the kidneys. Barker⁴ mentions a case studied by Thomas and Wentworth in which parathyroid hyperplasia was associated with chronic renal disease of ten years' standing. In this patient deposits of lime were present in the tendon sheaths and bursae of various parts of the body, and an X ray examination showed extensive calcification of the smaller arterioles. At autopsy a considerable degree of bony softening was found to be present.

There appears, therefore, to be good evidence of a connexion between chronic renal disease and parathyroid hyperplasia, and of the possibility of a mobilisation of calcium salts in the condition. As far as we can discover, however, no previous records exist of an increase in the serum calcium in chronic nephritis; as a rule, the calcium of the serum is diminished in proportion to the degree of phosphate retention present.

Recently Collip⁵ has studied the effects of an active extract which he has prepared from the parathyroid gland. By repeated injections he was able to raise the serum calcium of normal dogs to a level of 21 mg. per 100 c.cm. When the serum calcium exceeds 15 mg. symptoms of a condition which he describes as hypercalcaemia appear. These symptoms are weakness and atonia, diarrhoea and vomiting, circulatory impairment, extreme viscosity of the circulating blood, and ultimate collapse and death. The extreme viscosity of the circulating blood, which according to Collip makes it difficult to obtain blood even by venesection, was not noted in our case. The chemical changes in the blood that result from such injections are a great increase in the urea nitrogen, a gradual fall in the halogen content of the blood (which, it may be suggested, is a result of the vomiting), a terminal rise in the phosphate content, which is at first unaffected, and a pre-mortal fall in the alkaline reserve of the plasma. It is not as yet clear whether these changes result from a direct action on the kidney, or whether the primary circulatory failure leads to renal inadequacy with the above characteristic changes in the blood. It is, however, obvious that normal dogs may, after repeated injections of the parathyroid hormone, show a chemical blood picture resembling that seen in our patient.

The paralysis of the recurrent laryngeal is a readily conceivable pressure effect in parathyroid enlargement. The cause of the increased basal metabolism remains obscure. No evidence of hyperthyroidism was present, and the action of parathyroid on the basal metabolism does not appear to have been worked out. If the blood-sugar curves are accepted as evidence of increased sugar tolerance, such an effect is to be expected in parathyroid hyperplasia, since

parathyroidectomy is reported to produce a diminished carbohydrate tolerance in animals. Salvesen⁶ has shown also that in parathyroidectomised animals the carbohydrate tolerance curves rise as the serum calcium falls, and believes that a direct connexion exists between the serum calcium content and the capacity of the organism to deal with ingested carbohydrate. Attempts were made to reduce the serum calcium in our patient by administration of sodium bicarbonate, and di-sodium phosphate, but no definite results were obtained.

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YATREN IN THE TREATMENT OF AMOEBIC DYSENTERY.

WITH A NOTE ON THE RESULTS OF STOVARSOL IN CERTAIN CASES.

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SINCE the introduction of emetine in the treatment of amoebiasis in 1912 various improvements in the therapeutics of amoebic dysentery have been made. It is now generally conceded that emetine injections, although temporarily successful, do not eradicate an amoebic infection from the bowel, even when administered in almost toxic doses. Hence emetine bismuth iodide and its modification, emetine periodide, have been largely employed in the treatment of the disease and have proved themselves efficacious to a considerable extent in the acute, as well as in the chronic, stage with the passage of *E. histolytica* cysts.

There are several objections to the continued use of these emetine compounds; amongst others may be cited their nauseating and debilitating effects, the liability to develop symptoms of emetine intoxication, the very restricted diet upon which it is necessary for the patient to be placed, and to these may be added the general depressing after-effects, mental and physical, which too often result from their use. In a certain proportion of cases of chronic amoebic dysentery (variously estimated by different authorities) the organisms become resistant to emetine, and under these circumstances it appears to be useless to continue further emetine treatment with the idea of effecting a permanent cure.

The occurrence of emetine-resistant forms has been tolerably familiar to tropical practitioners since the end of the war, and it is for this class of case that Yatren was originally introduced by Mühlens and Menk in 1921.

Yatren ($C_9H_6O_4SNI$) is a combination of iodine with oxyquinoline-sulphonic acid with the addition of 20 per cent. sodium bicarbonate. The iodine is so firmly combined that it is not given off on boiling nor split off within the body of man, hence it cannot produce iodism. For the last ten years Yatren has been in use in Germany and Holland as a wound antiseptic and tissue stimulant. Under the name "Yatren Purissimum No. 105," it is manufactured by the Behring Institute, Marburg/Lahn, Germany. The drug, when given by the mouth or enema, is rapidly absorbed, and is to a great extent excreted in the urine, where its presence can be demonstrated five or six hours later by the addition of ferric chloride, with which it gives a green colour.

In the treatment of amoebic dysentery Yatren may be exhibited in one of three ways: in pill form, containing 0.25 g. (4 gr.), of which two are given twice daily; in cachet form of 0.5 g. (7½ gr.) twice daily by the mouth; or by enema of 200 c.cm. containing 3-6 g. of the drug given daily for 8-14 consecutive days. In 1921 Mühlens and Menk reported upon two extremely resistant cases of amoebic dysentery which had been completely cured by Yatren given by mouth and per rectum. Birt in Shanghai, in 1923, treated a series of 28 cases by lavage alone, using 100 c.cm. of a 10 per cent. solution twice daily, and he concluded that it was a good treatment, but not more efficacious than others previously in use; whilst in many, particularly in the freshly infected cases, the patients suffered much more from colic and tenesmus as a result of the injection. The criticism of his results by Menk is to the effect that the menstruum was too small in quantity and the concentration too great. In 1922 Kuenen published details of four cases all cured by Yatren given by the mouth in doses of 3 g. daily for 8-14 days. In the only paper on the subject in English, Gordon notes two cases treated by lavage which relapsed in a short time; the doses were those originally recommended by Mühlens and Menk. Recently a considerable amount of literature has accumulated round the subject, of which a number of references will be given at the end of this paper.

During the last six months we have had the opportunity of treating four typical cases of amoebic dysentery of different degrees of severity with this drug. We make a special point of stating that diagnosis and treatment have been controlled by sigmoidoscopic examination, a method which is more reliable than stool examination alone.

Clinical Reports.

The following are brief details of these cases.

CASE 1.—Ex-soldier, Indian infection; five months' duration; acute symptoms. Loss of 4 st. in weight (actual weight 9 st. 2 lb.). Stools, four to five a day, containing blood, mucus, and very numerous active free *E. histolytica*. Sigmoidoscopy.—Mucous membrane of rectum appeared as an extensive bleeding ulcerated surface, the intestinal lumen being full of extravasated blood, constituting a picture of the most marked amoebic ulceration yet seen on sigmoidoscopic examination (P. H. M.-B.). General condition of patient poor.

Treatment.—Yatren 2½ per cent. solution; 200 c.cm. by enema daily for five days and then, after a four-day interval, a further similar course (10 treatments) and concurrently Yatren pills (1½ g. daily) for 19 days.

Results.—Entamoebæ disappeared from stools, which became formed and normal within four days. Sigmoidoscopy repeated 23 days after commencement of treatment; former ulcerated areas now appear as non-depressed diffuse granulating patches which do not bleed. No active ulceration seen. General condition much improved. After one month in hospital gained 18½ lb. in weight. Improvement maintained now for over four months on ordinary diet.

CASE 2.—Ship's cadet. Infection contracted in Mauritius. One and a half years' duration; acute symptoms; loss of 1½ st. in weight; stools four to five a day, diarrhoeic, blood and mucus, free active *E. histolytica* in large numbers. Previously treated with injections of emetine, pulv. ipecac., bismuth and opium, &c.

Sigmoidoscopy.—Granular eroded patches in rectum and definite ulceration as far as could be seen. General condition poor.

Treatment.—Yatren 2½ per cent. solution; 200 c.cm. for six days together with Yatren pills (1½ g. daily) for ten days.

Results.—Entamoebæ disappeared from the stools, which became normal on the fifth day. Presence of Yatren demonstrated in urine. Sigmoidoscopy one month after treatment showed a few pin-point submucous hæmorrhages and scanty minute depressions in mucosa at site of former ulcerations; otherwise normal. General condition of patient much improved, gain of 1 st. in weight. Stools have been examined on five occasions during the last four and a half months since his discharge; general good health maintained; stools normal in number and consistency; no entamoebæ or cysts.

CASE 3.—Colonial official. Nigerian infection; two years' duration; acute symptoms off and on for one year; recently passed through an attack of amoebic hepatitis. Loss of 3½ st. in weight. Stools five a day with blood and mucus and active free *E. histolytica*.

Sigmoidoscopy.—Typical diamond-shaped amoebic ulceration of rectum extending to anus. General condition of patient poor.

Previously Treated.—In hospital on two occasions for same condition. Had received 42 injections of emetine (gr. 1 each), also 90 gr. of emetine in Nigeria; 72 gr. of E.B.I. (two courses); 52 gr. of E.P.I. and other drugs. On each occasion relapse occurred with passage of typical stools within three weeks.

Present Treatment.—Yatren 4 per cent. solution, 200 c.cm. by enema daily for ten days (i.e., 80 g. of Yatren) together with 1½ g. by mouth daily in pill form for three weeks.

Result.—Remarkable improvement in general condition; gained 2 st. in weight within six weeks of cessation of treatment; states "Since course of Yatren I feel an entirely different person." Stools one daily, formed, and on 11 examinations in two months after cessation of treatment were negative for amoebæ or cysts. Has now returned to Nigeria in good health.

CASE 4.—Business man. Infection in Cape Verde Islands; 2½ years' duration; acute relapses from time to time during that period. Acute symptoms on admission. Loss of weight about 1 st.

Stools.—Diarrhoeic, two a day, blood and mucus, free active *E. histolytica*.

Previous Treatments.—34 gr. of emetine; 16 gr. of E.P.I., 1 g. of N.A.B., and potassium permanganate lavages.

Present Treatment.—Yatren 2½ per cent. solution; 200 c.cm. for six days.

Sigmoidoscopy.—At end of treatment showed healing and granular patches in rectum.

Gain of weight 9 lb. during treatment; general improvement. Six weeks after cessation of treatment: no acute symptoms, but cysts of *E. histolytica* were found on examination of stool. Course of E.B.I. subsequently given with resultant disappearances of cysts. Good health and improvement maintained for last three months.

Summary.

The results may be summarised thus. The first three cases may be considered as uniformly satisfactory, whilst the fourth is less so, but was only incompletely treated with Yatren, the eradication of the infection being subsequently brought about by E.B.I. To those who have studied the details of the above protocols, we would like to point out that the rapidity with which Yatren acts in the acute stage of the disease is remarkable, amoebæ being apparently destroyed in four days after the injection of Yatren by enema.

In our opinion, in order to get the maximum effects, the drug has to be administered per rectum, as well as by mouth. To do this successfully, the bowel has to be previously washed out with a 2 per cent. solution of sodium bicarbonate about one-quarter of an hour before the injection of Yatren, which must be done slowly by means of a funnel and tube. The solution is then retained as long as possible and then voided. In our cases the average time of retention was about eight hours, occasionally as long as 12 hours. No toxic disturbances appear to be produced by the absorption of the drug.

Yatren is said, by many writers on the subject (Mühlens and Menk, and others), to produce a specific diarrhoea, but in cases of amoebic dysentery we have not encountered this phenomenon, though in other bowel conditions, such as ulcerative colitis and chronic bacillary dysentery in which we have also given it a trial, it readily does so.

Conclusions.

Yatren is of definite therapeutic value in the treatment of amoebic dysentery. Our cases are limited in number, but were all very typical examples of the disease. The results have been most gratifying and are apparently permanent. From the patient's point of view Yatren therapy is more pleasant than any yet evolved, the toxic effect being almost negligible, and there being no necessity to restrict the patient's diet unduly. As the drug is not nauseating our patients have been on a diet of fish, eggs, milk and milk puddings, and toast throughout their course of treatment. (Case 3.)

NOTE ON TREATMENT OF CASES WITH STOVARSOL.

One great difficulty in the effective treatment of amebiasis is the chronic cyst-passer, or the man who continues to excrete cysts of *E. histolytica* subsequent

to the cessation of acute symptoms. For this purpose we have recently been exhibiting tablets of stovarsol, as recommended by Marchoux. This drug is given in 4-gr. tablet by the mouth, and has been used in the treatment of syphilis; it is an acetyl-oxy-amino-phenyl compound of arsenic acid. A considerable amount of literature has accumulated round this drug, and it appears to be especially adapted for the symptomless cyst-passers who cannot, or will not, undergo a drastic course of E.B.I. treatment. One tablet of the drug is taken after breakfast daily for 14 consecutive days in two courses with an interval of a week's duration between them, so as to avoid any possible manifestation of arsenical intoxication. Two medical officers, who were cyst-passers, have been treated in this manner recently. The cysts disappeared from the stools after the first week of treatment, and we concluded that the use of stovarsol as an after-treatment is to be recommended, its value being probably due to its tonic effects.

Quite recently we have had the experience of two good cases of relapsing amoebic dysentery, who proved to be particularly resistant to E.B.I., so that their eventual recovery may be ascribed to stovarsol.

CASE 1.—The patient had been under observation for 2½ years. Had had four attacks of acute amoebic dysentery including one relapse with hepatitis. His treatments had consisted of five courses of E.B.I. of 36 gr. each; two courses of E.P.I., and over 100 gr. of emetine. During his last relapse he was exceedingly ill and lost over 1 st. in weight. Since October, 1924, he has taken stovarsol in two courses of 8 gr. daily. During the recent period of observation, since the beginning of 1925, his health has much improved, his weight has increased by 42 lb., and his stools are normal and consistently negative for amoebae and cysts.

CASE 2.—Infection contracted 1922 in Java, where he was treated with emetine, E.B.I., and ipecacuanha. In England in June, 1924, an acute relapse occurred for which he was treated with 24 gr. of E.B.I.; relapsed again four months later, and he was then given stovarsol in large doses of 12 gr. daily for 14 days and subsequently 1 tablet daily for two months. Since then he has been free of symptoms, the stools have been examined at intervals on five occasions, and when last seen in May, 1925, was in good health and has regained his normal physical condition.

Conclusions.

We may thus regard stovarsol as an adjuvant of considerable value in the treatment of amoebiasis. We have no evidence that it acts as a direct amoebicide, but it has a definite therapeutic value in the chronic stage of the disease, and may be recommended in those cases which are resistant to or intolerant to emetine and its compounds. As toxic symptoms due to absorption of arsenic are apt to occur, the dose of 2 tablets daily (gr. viii.) for one week, or 1 tablet daily (gr. iv.) for 14 days, should not be exceeded.

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(Continued at foot of next column.)

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

THIS Section met on three days under the presidency of Sir Maurice Craig.

WEDNESDAY, JULY 22ND.

Causation and Symptomatology of Multiple Neuritis.

In opening a discussion on this subject, Dr. T. Grainger Stewart (London) defined cases of multiple neuritis as "those in which, as the result of a general cause—toxic, infectious, or metabolic—the symptoms present pointed to a more or less simultaneous affection of many of the peripheral nerves, or of their associated peripheral neurones." By this definition all cases of neuritis directly due to local traumatism or compression were excluded, but not those in which the neuritis arose as the result of the general action of a toxin, developed locally in connexion with a local lesion. Further, it permitted the inclusion of cases in which the peripheral neurones, rather than the peripheral nerves proper, were involved. Dr. Grainger Stewart considered it quite impracticable in the present state of our knowledge to attempt to classify multiple neuritis on any other than an aetiological basis, as although the clinical picture in certain forms of multiple neuritis was distinctive, in the majority of cases no clinical differentiation was possible. He would, therefore, classify the different forms as follows:—

(A) *Exogenous Poisons*.—Lead, arsenic, mercury, &c.; alcohol, carbon monoxide, carbon bisulphide, serum disease, &c.

(B) *Endogenous Toxins*.—(1) Metabolic: Diabetes, beriberi, hæmatoporphyria, and during pregnancy. (2) Cachectic: Malignant disease, senile, chronic anæmia, &c. (3) Infective: (a) In association with acute infective fevers, &c.—typhoid, paratyphoid, &c.; tubercle, syphilis, &c. (b) In certain epidemics—e.g., influenza. (c) Infective disease in which the neuritis was an essential part of the clinical picture—uveo-parotitic paralysis, pink disease. (d) Infections in which the toxin had a special affinity for the nervous system—e.g., diphtheria. (e) In acute, subacute, or chronic infections whose incidence was chiefly on the nervous system—acute toxic polyneuritis, acute febrile polyneuritis, acute infective polyneuritis, Landry's paralysis, and recurrent multiple neuritis.

(C) *Multiple Neuritis of Obscure Origin*.—Rheumatic.

(D) *Local Infections of Nerves*.—Leprosy, interstitial hypertrophic neuritis: (1) juvenile (Dejerine-Sottas), and (2) adult (Dide and Courjon).

(Continued from previous column.)

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The two principal factors which determined the mode of onset and the distribution of the symptoms were: (1) the selective action of the poison, and (2) the distribution of the poison within the nervous system. It was known that the nervous system had the property of fixing certain toxins, such as those of tubercle, diphtheria, and tetanus, owing to a special chemical affinity. The distribution of the toxin was also influenced by the selective factor, and its incidence was determined in the first place by the paths along which the toxin reached the nervous system. There were two such paths: (1) the blood, and (2) the nerves (perineural lymphatics).

In dealing with the various forms of multiple neuritis the opener referred chiefly to three of that group due to exogenous poisons—viz., the neuritis of alcohol, lead, and arsenic. Alcoholic neuritis was now more rare than formerly, and appeared to be more frequent in spirit-drinkers than those addicted to beer. The characteristic features in all cases of alcoholic neuritis were: (1) The severity of the pain and sensory disturbances; (2) the acute tenderness of the nerves and muscles; (3) the tendency for the lower limbs to be affected earlier and more severely; (4) the weakness predominating in the extensor muscles; (5) the rapid onset of contractions and deformities; and (6) the occurrence of mental changes of a typical character. The latter—known as "Korsakow's psychosis"—consisted in an amnesia for recent events combined with a disorientation in space and time. With regard to lead neuritis, the palsy was only one of the manifestations of lead poisoning. The special features were: (1) The absence of sensory symptoms—apart from muscular cramps; (2) the nerve trunks were not tender; (3) the upper extremities were more affected than the lower and the palsy was often confined to certain groups of muscles; and (4) other evidences of lead poisoning were present—anaemia, colic, blue line in the gums, and vascular changes. Various clinical types had been described, among which were: (1) The antebrachial type (Remak)—seventh cervical, in which the extensors of the wrist and fingers, the extensor and long abductor of the thumb were paralysed, causing drop-wrist. The supinator longus muscle—innervated from the fifth cervical root—generally escaped. (2) The Aran-Duchenne type—eighth cervical and first dorsal—characterised by weakness and wasting of the intrinsic muscles of the hand; and (3) the Duchenne-Erb type—fifth and sixth cervical, in which the dorsal, biceps, brachialis anticus, and supinator longus were chiefly affected. The clinical picture in lead palsy, therefore, pointed to an affection primarily of the lower motor neurone and its segmental or radicular distribution to a neuronic rather than to a neuritic affection. Apart from the occurrence of arsenical poisoning, accidental or intentional, the condition might arise from the prolonged use of arsenic in the treatment of chorea or the severe anaemias. All four extremities were wholly affected, while severe sensory disturbances, trophic changes, falling of hair, hyperkeratosis, and pigmentation were characteristic features.

The most important of the metabolic group was the neuritis of diabetes, and it was present in about 50 per cent. of cases of that disease. Sensory symptoms predominated, and examination showed that the deeper forms of sensation were more affected than the superficial. It was rare to find complete paralysis, but definite muscular weakness was easily demonstrable; the lower extremities were more often affected than the upper. Multiple neuritis had been found in association with most of the well-known varieties of infectious disease, either during the course of illness or supervening upon it. Diphtheria provided us with an example of multiple neuritis occurring in an organismal infection developing its local lesion on a surface of the body, and at the same time evolving a toxin with a selective action on the nervous system. Paralysis occurred in about 20 per cent. of cases. Experiment had shown that antitoxin would prevent paralysis and statistics that no multiple neuritis

occurred in those cases in which the bacilli were destroyed early. It was only when the local lesions had been missed or neglected that severe paralysis followed a mild infection.

To the group which he had termed "acute, subacute, and chronic infections with incidence chiefly on the nervous system," Dr. Grainger Stewart proposed to add Landry's paralysis. In Landry's paralysis the onset might be abrupt with ascending paralysis commencing at the periphery of the lower extremities—ascending even to the facial muscles provided death had not resulted from respiratory paralysis. The paralysis was flaccid, painless and sensory disturbances rarely exceeded a mild paræsthesia in the extremities. In some cases the onset was less abrupt and the paralysis might be of a descending type or even appear to spread from the site of onset both upwards and downwards. If we compared this with the descriptions of acute febrile or acute infective polyneuritis given by Bradford, Bashford and Wilson, and by Holmes, we found no material difference. Extending from the toes upwards, the paralysis affected the trunk muscles, arms, and face, the facial palsy—although sometimes of slight degree—being a characteristic feature. Sensory changes had not been marked.

Dr. Grainger Stewart said he had seen several cases of Landry's paralysis and over 20 cases of acute toxic polyneuritis. In some of the latter the diagnosis was based solely upon the development of sensory disturbances 10 to 14 days after the onset of the paralysis; had death occurred before, they would certainly have been accepted as being typical of Landry's original description. Now, in all these cases we had the following resemblances: (1) An acute ascending paralysis of flaccid type with abolition of deep reflexes; (2) a febrile onset; (3) only slight disturbances of sensibility; (4) transient interference with sphincters; (5) absence of mental changes. Cases of recurrent multiple neuritis had been described. The symptoms were predominantly motor, each attack left the patient weaker than before, there was more wasting than was usually found in multiple neuritis, and the attacks occurred without known cause at irregular intervals. In view of all facts, it was no longer possible, he said, to limit our conception of multiple neuritis to one in which the peripheral nerves alone are affected. We should think in terms of neurones, as it was illogical to separate a nerve cell from its fibres; they were essentially one from the point of view of function, and interference with either must, and does, affect both.

Discussion.

Dr. Wilfred Harris (London) commented upon classification and considered that Dr. Grainger Stewart's groups (c) and (d) would probably fall into either the "Exogenous poison" or the "Endogenous toxin" group. Leprosy did not appear to him to be a cause of multiple neuritis. Korsakow's psychosis also occurred in connexion with neuritis other than that due to alcohol, and multiple neuritis might develop from local septic wounds apart from diphtheria. With regard to the alleged neuritis of serum disease, he thought that such neuritis was more likely to be a result of the infective disease for which the serum was given rather than of the serum itself; during the war, while acting as a tetanus inspector, he had seen many serum-treated cases and had met with no neuritis as a result. Dr. Harris disagreed with Dr. Grainger Stewart that lead neuritis was segmental in distribution; the radial extensors were innervated not from the seventh cervical segment but mainly from the sixth and even the fifth. The Aran-Duchenne type, he considered, was due to chronic anterior poliomyelitis, and, as distinct from wrist-drop, was permanent and incurable.

Dr. W. Johnson (Liverpool) dealt with certain atypical forms of lead neuritis which did not appear to harmonise with the theory of the selective action of the toxin and compelled us to seek an additional explanation. Fatigue might be a contributory factor.

Edinger, of Frankfort, originally advanced the view that in a condition in which toxins are circulating through the system the poisoning effects are liable to occur chiefly in those structures which have been the seat of fatigue. The ordinary painter used a free flexion and extension movement at the wrist in performing his work; the extensors were at a mechanical disadvantage as compared with the flexors and were therefore more susceptible to fatigue. The right arm was more commonly affected, but if the patient were left-handed, then the left arm showed the more marked paralysis. In the occupation known as "puddling" a heavy scraper was used which threw considerable strain on the shoulder muscles. In such cases the upper arm type of lead palsy was the more common.

Dr. F. J. Nattrass (Newcastle-on-Tyne) drew attention to the occasional occurrence in cases of multiple neuritis of enlargement and hardening of the nerves. He had met with two such cases. Portions of the musculo-cutaneous nerve of the leg and the great auricular nerve were examined microscopically; some hundreds of serial sections revealed no anatomical changes beyond some oedema of the nerve sheath. In a longitudinal section of a portion of the great auricular nerve, however, a pre-capillary venule in the adventitial tissue at some distance from the nerve showed perivascular infiltration with large mononuclear cells.

Dr. S. A. Kinnier Wilson (London) agreed with the opener that in many cases the term "multiple neuritis" was a misnomer since changes were found not only in the nerve trunks but also in the nerve cells and muscles. Further, sensory changes might be entirely absent. A better term for such cases was "polyneuritis." The speaker was not impressed by Edinger's theory of fatigue. He also referred to the condition known as "central neuritis"—really a neuronitis—in which the medullated fibres of the central nervous system were affected.

Dr. C. Worster-Drought (London) referred to the occasional occurrence of nystagmus in polyneuritis, and particularly in the alcoholic form; a case of the latter disease showing pronounced nystagmus was under his care at the present time. With regard to a question raised by Dr. Grainger Stewart, the speaker had seen the neuritis of diabetes improve *pari passu* with improvement in the diabetic symptoms both on dietetic treatment alone and with insulin. Syphilitic neuritis was an interesting though somewhat rare form of polyneuritis—or more strictly, polyneuritis, since sensory changes were usually absent. The condition, when present, usually appeared late in the secondary stage and with suitable treatment the prognosis was exceedingly good. Dr. Worster-Drought also described a case of recurrent multiple neuritis which he had observed over a period of two years; the onset and each recurrence was ushered in by acute gastro-enteric symptoms. The case had been fully investigated from the clinico-pathological standpoint but, apart from certain blood-cell changes, with negative results.

Dr. A. F. Hurst (New Lodge Clinic) raised the question of latent peripheral neuritis. Absent ankle-jerks, he considered, might be the only sign of alcoholism. Such cases could be distinguished from early *tabes dorsalis*, as in the latter disease the calves were analgesic, whereas in alcoholic neuritis they were very tender. It was very rare to find alcoholic neuritis and cirrhosis of the liver coexisting; indeed, they appeared mutually exclusive. In alcoholics who died of cardiac failure it was often surprising what few changes were found in the heart muscle on post-mortem examination; the cardiac disorder, he considered, was largely due to a disturbance of the vagus nerve. In certain cases of *beri-beri* Dr. Hurst considered that in addition to vitamin deficiency as an aetiological factor there was an infective agent. In the Gallipoli campaign, for instance, *beri-beri* was often accompanied by jaundice; in these cases the duodenum was found post mortem to show evidence of inflammation.

In the unavoidable absence of Dr. J. S. Collier (London) his observations were read by Dr. E. Mapother. Dr. Collier considered it peculiarly fitting that Dr. Grainger Stewart should open the discussion on multiple neuritis, since it was his father—Sir Thomas Grainger Stewart—who wrote the first English monograph on the subject 45 years ago. Dr. Collier also mentioned the occurrence of nystagmus in polyneuritis, and thought the phenomenon was due to involvement of the cerebellar neurones. The lesions of multiple neuritis were not necessarily symmetrical; he had seen cases of both lead and alcoholic neuritis which were strictly unilateral. He was glad to see Landry's paralysis placed in its proper position as a polyneuritis by Dr. Grainger Stewart. Lastly, Dr. Collier referred to cases of neuritis due to the too enthusiastic and unduly prolonged administration of bacterial vaccines.

The President of the Section observed that it was important to examine the mental aspect as well as the physical in many forms of peripheral neuritis; minor mental changes in such cases often passed unrecognised. He pleaded for just as much care to be devoted to the mental examination as was given to the motor and sensory signs.

Prof. Edwin Bramwell (Edinburgh) emphasised the fact that in many cases of acute polyneuritis the aetiology was most obscure. In many cases, he believed, there was more than one active aetiological factor—e.g., an attack of influenza might determine the onset of neuritis in a victim of lead poisoning. He also referred to the occurrence of polyneuritis in association with hyperemesis gravidarum and described a case which showed the usual signs of multiple neuritis together with nystagmus and bilateral facial paralysis; later a Korsakow's psychosis developed. In the causation of some obscure cases there might be a food factor, the patient being unable to digest and absorb the necessary vitamins.

THURSDAY, JULY 23RD.

The Treatment of Insomnia.

Dr. Robert Hutchison (London), opening a discussion on this subject, said that for the purposes of treatment he divided cases of insomnia into two groups, (1) secondary, and (2) primary. In the secondary group the insomnia was the result of some physical discomfort—such as pain, dyspnoea, cough, flatulence, &c. The primary or intrinsic cases arose either from some psychological discomfort (worry, anxiety, &c.) or they were originally secondary cases, in which the physical cause having disappeared, the insomnia persisted largely as the result of auto-suggestion.

1. *Secondary Insomnia.*—The treatment of the secondary cases was primarily that of the associated disease. There could be no objection to the use of hypnotics in these cases from the fear of establishing a habit, as we were usually dealing with a disease of short duration in which the promotion of sleep was essential for the maintenance of the patient's strength and powers of resistance. When the insomnia was due to pain, analgesic drugs—*aspirin* and *pyramidon*—should be tried before morphine. In sleeplessness from dyspnoea, the hypnotic used depended upon the cause of the dyspnoea. For cardiac cases there was no drug to equal morphine, but in dyspnoea of pulmonary origin—e.g., bronchitis—it was contra-indicated. In such cases opium might be given in the form of Dover's powder; strychnine and oxygen were useful adjuvants. Pneumonia was a disease in which insomnia often resulted from a variety of factors—pain, fever, cough, dyspnoea, and toxæmia all playing a part. In the early stages—before the fifth day—morphine was much the most effective agent for promoting sleep; after the fifth day, however, it was rarely safe to use morphine, and opinions differed as to the most suitable hypnotic. Chloral was effective, and in Dr. Hutchison's opinion the depressing effect of this drug on the circulation had been exaggerated. Paraldehyde was safe but uncertain in its action; a dose of at least 2 drachms was required to produce an effect. For allaying

a cough causing insomnia, codeine was probably the best remedy. In the sleeplessness of uræmia, morphine was most effective and the common prejudice against its use in renal cases he considered unjustified.

2. With regard to *primary insomnia*, it was as well at the outset to make sure that the case was one of primary insomnia and not one of secondary insomnia in which some physical discomfort—such as dyspepsia, flatulence, or constipation—had been overlooked. Flatulence, either in the stomach or colon, was specially liable to prevent sleep; it was worth while, therefore, when no psychical cause for the insomnia was evident, to try the effect of an alkaline carminative draught at bed-time. In primary insomnia, one's first duty was to inquire into causes of mental discomfort. As the elucidation and removal of an anxiety state might take considerable time, the first task was to try to get the patient to adopt the right mental attitude to the symptom. As most sufferers from insomnia exaggerated in their own minds the effects of not sleeping, one should explain that there was no fear of his either dying from insomnia or of going mad as a result of it. Also, it should be pointed out that health could be maintained on a much smaller allowance of sleep than most people took and that rest and muscular relaxation were to a large extent a substitute for it. Unless the insomnia had resulted from mental overwork—and this, in the absence of coexisting worry, was a rare cause—when a holiday might effect a rapid cure, Dr. Hutchison believed it best to attempt to cure the insomnia in the environment in which it arose. Institutional treatment, however, had its advantages in cases requiring prolonged psychotherapy and, of course, in all psychoses.

With regard to drugs in the treatment of insomnia, the speaker believed it cant to say that hypnotics should only be used as a last resort and that the fear of establishing a habit was a bugbear; the possibility of the insomnia becoming a habit was a much more real danger. The removal of an anxiety state or the resolution of a conflict took time, and meanwhile, especially if the insomnia was becoming absolute, artificial sleep must be induced. As we could not afford to fail without making the patient worse, it was wise to begin with a hypnotic and dose rather more powerful than was really necessary. The bromides were, therefore, only indicated in the mildest cases; bromural and adalin were better for the less severe insomnias. Of more potent drugs, veronal or medinal (sodium-veronal) in $7\frac{1}{2}$ grain doses would meet most indications. Chloral had fallen too much into disuse; it was wise to avoid it in cases of myocardial degeneration, but otherwise Dr. Hutchison believed it quite safe. Trional, from its delayed action, was specially indicated in those cases in which the patient was awake only during the latter part of the night (the so-called *internocturnal insomnia*). Luminal was unnecessarily powerful for use unless in exceptional circumstances, and morphine should never be given for primary insomnia outside a mental hospital.

Dr. Harry Campbell (London) defined insomnia as the "inability to enjoy a sufficiency of sleep under moderately satisfactory conditions." In the treatment of all cases of insomnia an attempt must be made to raise the level of the general health of the patient. Tranquillity of mind was essential to combat primary insomnia; the patient should endeavour to cultivate the idea that he is really going to sleep. Reading in bed, so long as it did not excite, often promoted sleep, and there were individuals who habitually read in bed until drowsiness compelled them to put out the light. Sources of irritation—cold feet, pruritus, nasal obstruction—which often interfered with sleep, should be sought for and treated. The bedroom should be dark, quiet, and well ventilated, and the bed placed away from the wall. In cases of high blood pressure the pillow should be high, but when the pressure was not supernormal and the patient was otherwise healthy, a low pillow was best. Open-air exercise was conducive to sleep and

a warm bath at bed-time, with the addition of a little mustard, was often helpful. As regards climate, high altitudes were unsuitable for bad sleepers; for most patients a low altitude and a relaxing climate were preferable.

Dr. H. Devine (Portsmouth) said that in the insomnia of the acute psychoses the use of powerful sedatives which stupefied the patient and which had been described as "chemical restraint" was steadily growing into disfavour. Endeavour should be made to assist Nature to bring about a cure by careful nursing and medical treatment—attention to digestion and the state of the bowels, frequent feeding with liquid diet, &c. Direct attempts should be made to promote sleep by sponging, hot packs, or if the condition permitted, prolonged baths. Hypnotics were often necessary, but they should be used as sparingly as possible and in conjunction with such methods as described above. The aim was not to treat the insomnia itself but rather the morbid process in the organism responsible for its occurrence. The insomnia of psychoses was essentially a secondary insomnia in the sense that it was a reaction to a morbid and sensitive state of the organism. There was a practical value in regarding all cases of insomnia as the outward expression of a mal-functioning organism.

Dr. C. P. Symonds (London) dealt with certain physiological factors underlying the function of sleep. The causes of insomnia due to an increase in the flow of stimuli to the cerebral cortex had, on the physical side, been dealt with by the opener of the discussion. On the psychical side it was unpleasant emotions, such as anxiety and fear, which readily prevented sleep. He considered that the principles guiding the use of hypnotics in cases of neurosis should be (1) not to continue drugs for more than a week or so without openly reducing the dose and observing the result, and (2) never to exhibit the same hypnotic for more than three nights in succession. A habit which was valuable in some cases was that of muscular relaxation. With training, the ability to relax could be developed so that a patient might learn to relax all his limbs in turn and finally together. Dr. Symonds was doubtful regarding the wisdom of allowing patients to read or play "patience" in order to pass the time; the practice might tend towards a habit of wakefulness.

Dr. E. I. Spriggs (Ruthin Castle) considered that the insomnia of overworked business men was best relieved by advising the patient to spend one or two hours in the open air each day, or at least every other day. A regular allowance of fresh air was most important for the individual working indoors. In nervous and excitable patients, a good plan for avoiding insomnia was to persuade them to take regular rest after the mid-day meal.

Dr. D. Stone (Northampton) said that the posture adopted in bed was important. A sleepless patient—especially one with digestive trouble—should sleep on the right side, as in that position it was easier for the stomach to empty. It was not wise to go to bed on an empty stomach; a moderate meal was advisable. From personal experience in general practice, he thought paraldehyde was the best hypnotic for routine use—1 drachm was usually sufficient.

Dr. W. J. Smyth (Bournemouth) spoke of the value of hyoscine in asylum practice. In adolescents insomnia was frequently due to some anxiety or fear and was usually only remedied finally by removal of the cause. In his experience medinal was the hypnotic that gave the best results in obstinate insomnia.

Dr. W. A. Potts (Birmingham) drew attention to the value of combining hyoscine with morphine in cases in which drug treatment was necessary; the combination enabled a smaller and safer dose of each drug to be used. In certain selected cases alcohol was valuable, and even a dose of "blue pill" was often efficacious.

Dr. C. Mortlock-Brown (Braunton) pleaded for further research in the physiology of sleep and considered that hypnotics should be used only as a last resort.

Dr. Mackenzie Wallis (London) spoke of certain experiments he had carried out regarding the relative toxicity of certain hypnotics. He had found that sulphonal, veronal, and medinal (sodium-veronal) in ordinary doses had no effect whatever on the functional activity of the liver and kidneys, nor was there any effect on general metabolism. All three drugs were rapidly excreted and showed no evidence of cumulative action.

Dr. T. A. Ross (Penshurst) considered that the insomnias termed primary were in reality secondary, but that the cause was less obvious. He agreed that it was sometimes necessary to give hypnotics in cases of neurosis, but believed that the practice tended to inhibit the process of psychological investigation.

Dr. Woods Hutchinson (California, U.S.A.) said that insomnia depended upon the testimony of the patient, and the patient was usually incorrect in his statements, since no individual could testify as to how long he slept. The aim should be to try to make the patient physically fit in all respects and to persuade him to forget his insomnia.

Dr. R. Whittington (Hove) believed that the nature of the treatment adopted largely depended upon the temperament of the patient; one form of treatment might suit one individual but not another. He would have wished to hear more of hypnotism and suggestion in the treatment of insomnia.

Dr. H. Crichton-Miller (London) had found that dyspepsia was often a basis on which insomnia developed. In many cases the circulation was also at fault. He did not consider that the exhibition of hypnotics hindered a psychological investigation.

The President of the Section, in bringing the discussion to a close, said one had to think of the patient first and that experience had taught him that insomnia was often the key position to many graver conditions that might arise later. Physiologists had shown that the repair of fatigued tissue took place only during sleep. In his opinion sleeplessness should be relieved in its earliest stage—even in children. The danger of habit-formation was much exaggerated. The drug he favoured most was medinal; Dr. Mackenzie Wallis's observations constituted a good answer to the fostering of prejudice against such a sedative. He considered that if a particular hypnotic proved suitable, it was a great mistake to change it.

FRIDAY, JULY 24TH.

The Prophylaxis of Mental Disorder.

Sir Humphry Rolleston, in opening a discussion on this subject, stated that such a discussion, though in a special section, should be on very broad lines, for it dealt with the highest reaction of the human organism—in fact, with its reactions as a whole, whereas in other branches of medicine, one organ or system of organs chiefly attracted our attention. The public, as well as the medical profession, required education as to the way in which mental abnormalities should be regarded, and should be impressed with the commonplace that prevention was better and cheaper than cure, so that the earliest departures from the normal should at once be communicated to the doctor and remedial measures started without delay. The measures appropriate for the prevention of mental disorder were necessarily determined by the numerous forms of mental unsoundness. The multiplicity of the causes—hereditary, environmental, physical or bodily, and purely psychological—complicated the problem of prevention. Heredity and environment were closely interwoven in the causation of mental disorder as disposing and exciting factors respectively; the disease was the morbid reaction resulting from a complete set of external agents stimulating an inborn low margin of physiological resistance. The special form of nervous disorder was not inherited as such, but there was a low state of vitality. Although, generally speaking, more could be done in the way of modifying the environmental conditions—viz., by all that is included in the term

“mental hygiene”—measures to counteract gross hereditary disease, such as syphilis and cretinism, must not be neglected. Half the cases of mental disorder had been ascribed to hereditary factors. As a means of prevention this factor necessarily carried with it the difficult subjects of eugenics, sterilisation of the defective, and birth control. We might wisely hesitate before advocating strict eugenic measures of breeding, which, if carried to their logical conclusion, might seriously impair the future progress of the race; for if the inborn tendency to variation, which is responsible both for mental weakness and for intellectual ability, were thus removed, a dead level of standardised men, like “Robots,” might conceivably result. To a limited extent the Mental Deficiency Act (1914) had met the question of sterilisation of the mentally defective by diminishing the propagation of the handicapped child. Birth control was less drastic and difficult than the standardised propagation of the human race; it was widely practised, though far more often among those whose offspring would be of value to the race than among the very poor. The arguments against this practice were the risk of a falling population and the moral one that promiscuity would be favoured.

While fully recognising the indubitable influence of heredity, there was the opposite and more or less mechanistic conception that man's actions were determined by his response and adaptation to environmental stimuli. What was often assumed to be hereditary might really be acquired in early youth as the result of family environment and irresistible imitation. An inherited tendency might remain latent unless and until some stress was brought to bear on the individual, who then manifested symptoms of mental disorder, when an absolutely normal person would escape. The stress which was the exciting factor acted in virtue of the psychopathic predisposition, and might be: (1) Physical—trauma, infection, toxic factors, unhealthy environment, unsuitable diet; or (2) psychical—worry, emotional strain, overwork. Chronic infective foci and the resulting toxæmia, by diminishing the resistance of the body and by producing degenerative changes in the nervous and endocrine systems, constituted an important factor both in disposing to and even determining mental disorder. Auto-intoxication due to oral, tonsillar, and intestinal infection was sometimes an obvious factor. Responsible focal infections, especially disease of the accessory nasal sinuses, might remain latent and escape detection. At the New Jersey State Hospital, Trenton, the number of discharges increased from 37 to 85 per cent. after removal of oral and tonsillar infections (H. A. Cotton, 1923). The effects of alcoholism and syphilis and the means of obviating these factors were well recognised. With regard to epidemic encephalitis, more information was needed as to the prevalence of carriers and their detection, the problems of immunisation, and of specific curative treatment. A further interesting question was the possible responsibility of primary deficiency of the endocrine elements of gonads for mental disorder. Sir Frederick Mott had shown that changes in the sex glands occurred in dementia præcox, but it was difficult to disprove the view that the endocrine maldevelopment was concurrent and part of the general bodily arrest of development or precocious degeneration. Endocrine deficiency of congenital origin—e.g., cretinism—might to some extent be prevented by antenatal treatment and environmental precautions. Overpressure in schools on clever boys likely to gain scholarships was a widely recognised but somewhat neglected danger, and not infrequently led to mental sterility in later life. Precocious able boys would, of course, be in forms with boys considerably older, and therefore would be likely to share the same hours of sleep, whereas they required more on account of both their more tender years and their mental activity. Sufficient sleep and rest in the prevention of mental strain and breakdown were most important. Boys were not sent to school to earn testimonials to the transient success of a forcing system. The senseless and harmful punishment of writing out

hundreds of lines and keeping boys in after school hours should be regarded as relics of barbarism.

The speaker pointed out that the possibilities included in mental hygiene were extremely numerous; they concerned the home conditions and influences bearing on young children and the education in this respect of the parents; for the impression made by environment on the young mind was of the utmost importance. Mental hygiene was the first line of defence in the prevention of mental disorder, and its want or failure was shown by the need for early treatment in psychiatric clinics, which in their turn should preserve many patients from the necessity of having to enter mental hospitals. Early treatment in psychiatric clinics attached to general hospitals had many advantages; the education of the public to the recognition that mental disorder was intimately connected with bodily disease and not a distinct and mysterious condition; from the patient's point of view the avoidance of the stigma attaching in the public mind to residence in a mental hospital and especially certification; the provision of a much more satisfactory means of educating students, not only in mental disorders, but also in the understanding of the psychological aspects of everyday practice, &c. The prevailing note in the case of early and recoverable patients should be sympathetic conciliation rather than the forbidding coercion—cheerfulness and helpfulness instead of severity and repression.

Dr. Helen Boyle (Hove) agreed that the hereditary factor was difficult to control for fear of producing a race of individuals of dead uniformity. It should be remembered that many of those who have contributed largely to the arts were mentally unstable. Also there was no definite model at which to aim—nobody had yet seen the perfect man, and perfect physical formation did not necessarily mean good mental development. As regards birth control, at present the practice was only adopted by intelligent and thrifty people, and thus those most needed tended to be exterminated. Dr. Boyle also laid great stress upon the correct upbringing of children.

Dr. Bernard Hart (London) said that cases of mental disorder could be divided into two large groups: (1) Physiogenic, which included those cases ascribed to physical causes—toxic, endocrine, heredity, and other physical factors; and (2) psychogenic—a group much subdivided and varying with the different analytical schools of Freud, Adler, and Jung. It was difficult indeed to find a single factor in the aetiology of these cases on which uniformity of opinion could be based. Consequently, in devising preventive measures great care was necessary, and our fragmentary knowledge of aetiology had to be improved. It was important to recognise that in mental disorders there were no disease-entities; what occurred was a reaction of the whole organism to its internal and external stresses; while we clung to the disease-entity idea, it was difficult to harmonise the different aetiological factors. Dr. Hart pleaded for tolerance between the different schools of psychological thought and deplored the present lack of suitable institutional accommodation for psychoneurotics.

Dr. E. Mapother (London) considered it necessary carefully to distinguish between the early treatment and the prevention of mental disorder—that is, between measures taken after the appearance of the earliest symptoms and, on the other hand, measures designed to prevent the occurrence of even first symptoms. This distinction was important because demands for public help towards early treatment could reasonably be based on moderate claims regarding our powers, while appeals in aid of prevention should be founded on our almost total ignorance of and impotence in the prophylaxis of mental disorder.

Dr. Ross said that it was most important to get medical students more interested in minor mental maladies such as the psychoneuroses. At present they were interested in physical illness only, and, in consequence, when they became practitioners and met such cases they did not know how to

handle them; they either fussed over them unduly or neglected them. It was not possible for specialists or institutions to undertake the entire care and treatment of all psychoneurotics; they were too numerous and their cases were too prolonged. The patients needed support for a long time, and the bulk of this support should be given by the general practitioner.

Dr. Potts could not accept entirely the somewhat pessimistic attitude of Dr. Hart and Dr. Mapother, although he agreed that more detailed investigation and more knowledge were necessary. There was universal agreement that infections were existing factors and must be dealt with. Following this, if necessary, some form of psychotherapy should be employed. His idea was that the chief places for the prevention of mental disorder were the antenatal clinic and the nursery.

Dr. P. Watson-Williams (Bristol) dealt with the influence of toxæmia as a cause of mental disorder. He considered that by the detection and elimination of focal or other infections the occurrence of mental unsoundness could be prevented, relieved, or absolutely cured. He had seen elimination of sepsis in the nose, throat, or ear lead to the relief of neurasthenia, depression, and even delusional insanity. It was particularly latent or cryptogenic foci that were prone to cause chronic toxæmic conditions; where there is an obvious purulent discharge there was much local reaction and little tendency to toxæmia, but when the infection was associated with but little discharge, and that non-purulent or only opalescent and difficult to observe, toxæmic symptoms were more prone to arise. Hence a well-marked pyorrhoea alveolaris was less dangerous than the apical granuloma of latent dental sepsis.

Dr. Crichton-Miller agreed that the elimination of foci of infection was most important; a toxic factor might not be the entire cause, but it was the easiest to handle. He also described the blood-cell changes found in certain neuropaths.

Dr. C. A. Mortlock-Brown appeared to consider the present generation degenerate and maintained that self-control was better than birth-control. She also advocated the appointment of medical women to the Board of Control.

Dr. R. N. Craig (Torquay) gave details of two psychiatric clinics, attached to general hospitals, with which he was associated. There had been great difficulty in starting them owing to prejudice and opposition from even medical men, but the success attained by the clinics clearly showed that there was a demand for them.

The President of the Section said that over and over again he had seen mental factors neglected in patients at general hospitals; the patient was, in fact, treated in one respect (the physical) and neglected in another (the psychical). Cases of mental disorder due to toxic foci were frequently overlooked. He would deplore any attempt to eliminate the hypersensitive individual—the person who reacts quickly is often the most intellectual or the most successful in life. Unfortunately they reacted equally easily to environment and toxins. Overwork meant over-stimulation, and fatigued tissue was more likely to become infected than healthy tissue.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—In their annual report the committee of management state that it is "of vital importance that more beds should immediately be provided at the country branch," and King Edward's Fund has been asked to approve of plans for an additional 200 beds, estimated to cost at least £50,000. At the same time the out-patients' department has become "hopelessly inadequate," the attendances during the past year having exceeded 71,000. A new department, with nurses' home, resident medical officers' quarters, and workshops, will cost another £50,000, a total of £100,000, of which only £30,000 is in hand. Every branch of the work has again increased, and there is an adverse balance amounting, happily, to only £1500, as against more than treble that amount in 1923.

Reviews and Notices of Books.

HISTORY OF MEDICINE.

Proceedings of the Third International Congress of the History of Medicine. Antwerp: De Vliet. Pp. 320. 21s.

THE fourth of this series of congresses has just taken place in Geneva.¹ The volume under review contains the contributions presented to the Congress which met in London in July, 1922, and was attended by some 150 delegates from 16 countries. In the epidemic section, Dr. Tricot-Royer contributes an analysis of the orders of the town council of Antwerp against plagues in the sixteenth and seventeenth centuries, and also a description of the sixteenth century leper house of Hérentals and its documents. M. Jeanselme's paper shows the connexion of plague with the flood, famine, and earthquake which precede it, and Prof. Sir W. Simpson urges renewed attack on the problems of endemic disease in our own day. Dr. Wickersheimer gives an account of the Black Plague as it affected and was dealt with in Strasbourg in 1349, and of a "regimen" dating from this time; while Dr. R. Neveu describes the plagues of Tuscany in the fourteenth and fifteenth centuries, with an analysis of the reasons for the long-continued infections. Sir W. J. Collins gives a résumé of the work of Sir Edwin Chadwick, and Miss M. C. Buer discusses the decrease in epidemic disease in this country between 1750 and 1830, ascribing it to the improvement in medical science and popular hygiene accompanying the industrial revolution. In the anatomical section Dr. Ricardo Jorge's paper deals with the renaissance of anatomy and medicine in Portugal; MM. Laignel-Lavastine and Livet discuss the part played by symbolism in anatomy, with reference to the rules of divination, the teachings of astrological medicine, and the idea of correspondence between macrocosm and microcosm; Dr. J. G. de Lint publishes two new anatomical "flying sheets" and a fragment of an obstetric MS.; and Dr. E. T. Withington and Mr. Donald Campbell contribute papers on the anatomical writings of Galen. Prof. Ménétrier attempts to rescue the reputation of anatomists by citing instances of their humanity toward "subjects" handed over to them imperfectly executed and susceptible of restoration to life. Dr. V. H. Turkoman discusses the knowledge of anatomy possessed by the ancient Armenians, and also shows that that country was a pioneer centre for propagation of the practice of inoculation for small-pox. M. Fosseyeux's paper describes the anatomical studies of Descartes, and MM. M. Villaret and F. Moutier discuss plagiarism in anatomical illustrations during the sixteenth century. Dr. K. Lander deals with the anatomical studies of women before the nineteenth century. Mr. T. W. Parry describes prehistoric trephination in Great Britain. In the pharmacy section Dr. M. A. Van Andel describes the history of human fat as a medicament, and Dr. Van Schevensteen the use of remedies taken from the human body in the treatment of eye diseases. Dr. P. Dorveaux contributes a study of the seventeenth-century apothecary, Le Febvre Nicaise, and Mr. J. P. Gilmour sketches the history of pharmacy in the British Isles. M. C. H. Fialon outlines the statutes of the Master Apothecaries' Corporation of Lyons, and Mr. C. J. S. Thompson gives the history of Hiera Picra. In the veterinary section M. M. Sevilla writes on the "colic" syndrome in the Græco-Roman epoch. Major-General Sir F. Smith publishes an abstract of his paper on English veterinary anatomy from the sixteenth to the eighteenth centuries, and Mr. F. Bullock an abstract of his account of the fifteenth century MS. "Mulomedicina Chironis." M. L. Moulé describes the conditions grouped by ancient writers under the term "Malleus." Among miscellaneous papers are found one by Dr. F. G. Poynton on the

early aeronautical work of medical men; a study of Byzantine culinary recipes and ingredients by MM. Jeanselme and Oeconomos; and an account of the use of the Danish amulet "Muskatnuss," by Mr. J. W. S. Johansson. Of particular interest at the present moment is a description of the psychiatric ideas of Roman jurists by Dr. S. K. Waard. MM. Laignel-Lavastine and J. Vinchon contribute an account of the psychiatric work of Jean Schenck, and M. Jeanselme attributes the degeneration of the Carolingian family to hereditary neuropathic taints. Dr. N. G. Horner presents an amusing seventeenth century journal or daybook which belonged to Dr. John Westover, of Wedmore. Among the portraits published are one of Luis Mercado, physician to the Spanish court in the sixteenth century, and that of a young man, by Moroni, showing an apparatus for drop-foot. Of literary interest are Dr. J. Van Gils's comparison of the doctors of Molière with those delineated by Shaw, and a note by Dr. H. Leclerc on the reference to the "sacred thistle" in *Much Ado About Nothing*. Newly published texts include the preface of a thirteenth century Latin edition of the sixth book of "Epidemics" (Mrs. Singer), an Italian MS. giving a large number of hitherto unknown names of Salernitan doctors (Dr. P. Capparoni), and a treatise on air and winds published in 1642 by Panarolo (Dr. G. Hinsdale). The collection concludes with a paper by Mme. Panayotatou on hygiene and dancing among the ancient Greeks.

The volume may be cordially recommended to those who have a taste for medico-historical hors d'œuvres.

HANDBUCH DER TROPENKRANKHEITEN.

Third edition. Vol. II. By various Authors. Prof. Dr. CARL MENSE, General Editor. Leipzig: Verlag von Johann Ambrosius Barth. 1924. With 306 text figures, 4 black and white and 14 coloured plates. Pp 1019. G.M. 66-70.

THE second part of the new "Mense" is a ponderous volume comprising a vast amount of information upon a great variety of essential tropical diseases and subsidiary subjects. As has been customary in previous editions, the bibliography is remarkably complete. But the most important diseases do not appear to be arranged in any logical order; thus we have leprosy, undulant fever, cholera, psittacosis, plague, tsutsugamushi disease, sprue, beri-beri, tropical skin diseases, and those caused by tropical poisons, both of vegetal and animal origin, treated in sequence—a lack of method detracting from the real merits of the work.

The chapter on leprosy by Dr. Georg Sticker, of some 120 pages, includes a history of the disease from the earliest times and is a definite contribution to medical literature. Interesting statistics are given of the present-day distribution of leprosy; in China and the East Indies there are 50 lepers to every 100,000 inhabitants; in Finland, 2; in Egypt, 20; while in the Marquesas islands there are known to be 250 amongst a total of 4000 inhabitants. Dr. Martin Mayer is responsible for a succinct and well-written chapter on undulant fever. In the treatment of this particularly intractable fever attention is directed to the injection of colloidal metals, notably collargol. Cholera, from the pen of Dr. Paul Krause, is mainly remarkable for the chronological table of various cholera epidemics from the year 1817 onwards; the information being wholly derived from Russia from 1914 up to the present time. The various methods of treatment which have from time to time been advocated are given in detail, but no particular line is specially advocated, while the injection of hypertonic salines receives but scanty recognition. Dr. Filippo Rho writes on psittacosis, though it is by no means clear why this somewhat exceptional disease should be included in a treatise on tropical medicine. The article on plague is by Dr. P. C. Flou, of Leyden, and contains a careful description of the bacteriology of the disease, while the attention given to morphology of the various plague-disseminating fleas is noteworthy.

¹ THE LANCET, 1925, ii., 291.

Tsutsugamushi disease, or Japanese river fever, by Dr. M. Miyajima, comes from an authoritative source and is welcome on account of its comparative brevity and the excellence of the illustrations. The story of sprue, by Dr. Hermann Dold, occupies a great deal of space, of which the greater part is taken up by a detailed account of the pathological anatomy. The recital of many pathological items which apparently have no bearing upon the aetiology of the disease renders this section confused and inconclusive. Beri-beri, by Dr. Bernhard Nocht, is an extremely good account of the symptomatology and treatment of this peripheral neuritis; the whole subject of vitamins receiving adequate consideration. Tropical skin diseases, including oriental sore, ainhum, climatic bubo, veldt sore, ulcerating granuloma, and other less well-defined conditions are described by Drs. A. Plehn and Karl Mense, jun. We note that yaws and syphilis in the tropics, illustrated by some characteristic photographs, are also included in this section, though more generally regarded by other writers as being systemic in nature with cutaneous manifestations. The same authors are responsible for mycetoma, tinea umbricata, sporotrichosis, and other fungus diseases.

Poisonous symptoms due to tropical plant poisons are thoroughly discussed by Dr. Rho. Originality and thoroughness of this section make it the most striking contribution in the present volume. Dr. E. S. Faust deals with the analogous conditions produced by animal poisons, including snakes, fishes, reptiles, arthropods, and mollusca.

The general printing and reproduction of the illustrations are, on the whole, good.

AN INDEX OF TREATMENT.

By Various Writers. Ninth edition. Edited by ROBERT HUTCHISON, M.D., F.R.C.P., and JAMES SHERREN, C.B.E., F.R.C.S. Bristol: John Wright and Sons, Ltd. 1925. Pp. 1035. 42s.

AFTER an interval of less than four years the ninth edition of this well-known manual of treatment has been produced. Recent additions to therapeutical knowledge have rendered its issue advisable sooner than was anticipated. Two subjects hitherto omitted appear for the first time—namely, Infective Endocarditis (Sir Thomas Horder) and Spinal Analgesia (Dr. Felix Rood), while additions have been made to the article dealing with the general treatment of tuberculosis. The article on diabetes by Dr. Edmund Spriggs has been rewritten in the light of modern research, but we are glad to say that the same amount of space, or more, is still devoted to the informing tabular statements with regard to the composition and value of different foods and their arrangement for the various meals. It will be noticed that the article on asthma has been excellently brought up to date, and other sections which have received notable additions are those dealing with venereal and tropical diseases.

In its latest issue the Index of Treatment can be recommended, in accordance with previous notices, as a first-class book of reference.

INTERNATIONAL CLINICS.

A Quarterly of Illustrated Clinical Lectures and Articles. Vol. II. Thirty-fifth series. London: J. B. Lippincott Company. 1925. Pp. 311. Per set of four volumes, 50s.

THIS, the latest issue of a quarterly symposium of lectures and articles on medicine, surgery, and obstetrics contains, like its predecessors, many interesting sections contributed by well-known authorities. Among the contents of this volume which are especially noticeable may be mentioned a dissertation on the present status of affections of the kidney by Dr. I. W. Held of New York; a paper on

cystic neoplasms of the ascending mesocolon by Dr. C. G. Cumston of Geneva, in which the symptoms are well set out and the diagnosis discussed; and a suggestive essay by Dr. J. J. Walsh of New York entitled "The Patient or His Disease." Throughout this last paper the valuable advice is insisted on to observe the patient's mental attitude towards his own complaint; it is pleasant to note in this connexion a reference to a paper read before the Charaka Club in New York by Dr. Frederick Peterson, which dealt with the neuroses brought out among those who served in the American Civil War. It is clear from this paper that the experiences of more recent date were not without precedent in America, though the conditions of warfare were so different.

CLINICAL LABORATORY METHODS.

Second edition. By RUSSELL LANDRAM HADEN, M.A., M.D., Professor of Experimental Medicine, School of Medicine, Kansas City. London: Henry Kimpton. Pp. 310. 18s.

THIS book differs from most of the myriad others which have appeared in the last decade under closely similar titles in that theoretical and clinical considerations have been almost entirely eliminated; this has made possible the inclusion of a great deal of purely technical matter which must otherwise have been omitted from a volume of this handy size; and, while reducing its appeal to the student and general practitioner, very considerably enhances its value to the whole-time laboratory worker. The section devoted to biochemical procedures is by far the best; the author has limited himself to describing one technique only for each of the procedures included; his choice has not always fallen upon the particular one most popular in this country; in fact, as was more or less inevitable, it has usually failed to do so. In every case, however, the methods described are sound and well approved, and the descriptions of them are clear and accurate. Very valuable chapters are those on the use of the colorimeter and on the standardisation of quantitative reagents. The bacteriological section is of less value to English readers, and most of the illustrations are familiar.

THE ESSENTIALS OF HEALTHY LIVING.

By WILLIAM S. SADLER, M.D., F.A.C.S., formerly Professor at the Post-Graduate Medical School of Chicago. New York: The Macmillan Company. 1925. Pp. 481. 15s.

THIS appears to be at least the fourteenth book on health matters written by Dr. Sadler for the lay public as his contribution to the educational campaign now proceeding in America and other civilised countries for creating an "urge for health," as it has been called. As Prof. W. A. Evans says in an introduction, "health cannot be greatly improved from above downwards," and he quotes the baffling hopelessness of trying to improve the health of ignorant natives in tropical countries. Dr. Sadler believes that "personal hygiene is the keynote to the health teaching of the coming generation," and this book is a veritable text-book on the art of keeping healthy. It is a long way from the primitive poster with "Kill that fly" written upon it in large capitals to a volume of nearly 500 pages, but if only the intelligent section of the community, or at any rate those that can afford a guide to health at the price of this volume, can be "won for health," the movement will slowly spread downwards. Some of the chapters here strike an original note, particularly that on the history of preventive medicine with which the book opens, and one on "The Mission of Pain" which is full of common-sense teaching. The remainder of the volume deals along the usual lines with the different systemic diseases, diseases of various organs, and matters of general hygienic interest.

SYMPTOMS OF VISCERAL DISEASE.

Third edition. By FRANCIS MARION POTTENGER, A.M., M.D., LL.D., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, California. London: Henry Kimpton. 1925. Pp. 394. 28s.

THIS is the third edition of a book which the author in his preface states to cover a unique field in clinical medicine, the uniqueness, we believe, being to make the patient the chief object of study. We confess that we are still puzzled, as we were in previous readings of this suggestive book, to understand in what this claim to particular singularity consists. In general arrangement the book remains as before—that is, an introduction being followed by three parts entitled (1) Vegetative Nervous System; (2) Relationship between this System and Visceral Systems; and (3) the Innervation of Important Viscera and a Clinical Study of the Germane Reflexes. The reflections are often sound and sometimes obvious, and the work is beautifully illustrated.

A MANUAL OF PHARMACOLOGY.

Sixth edition. By WALTER E. DIXON, M.A., M.D., F.R.S., sometime Professor of Materia Medica and Pharmacology at King's College, London. London: Edward Arnold and Co. 1925. Pp. 478. 18s.

WE are glad to receive a new edition of this admirable manual. It has been completely revised in conformity with recent knowledge by Prof. E. Mellanby, Dr. O. Inchley, and Dr. A. J. Copeland, and additions are included covering all accepted knowledge on the subject of pharmacology. The information is imparted in a form useful alike to the student of pharmacy and of medicine.

We have noted before the essentially practical nature of the work, which is at the same time an exposition of the relations between physiology and medicine. Looking back on the way in which pharmacology was taught as recently as 25 years ago, we can see how the large and varied researches in physics and chemistry which have taken place in the interval have enabled teaching to assume the logical character which Prof. Dixon and his collaborators give to it. The reader, for example, of Chapter XVII. in this book, which deals with the drugs acting locally on the alimentary canal, will obtain arguments for therapeutic procedures which he may have to undertake daily in the course of practice. He will know both what to do and why he should do it, and throughout the volume consultation will put him in the same position along other lines. The manual is in the first rank of books available on its subject.

SCIENTIFIC PRESERVATION OF FOOD.

By THOMAS M. RECTOR, Consulting Chemist. London: Chapman and Hall, Ltd. 1925. Pp. 213. 10s.

It is not very evident for whom this book is intended. It gives a clear, but rather gossipy, account, freed from technicalities, of the different methods for the preservation of foods. Indeed, technicalities are so eliminated that the book will make but little appeal to the chemist, bacteriologist, or medical expert interested in the scientific data underlying the problems of food spoilage and their prevention. But to the medical man who wishes to obtain a broad general idea of the methods employed in food preservation, this book may make appeal, and it will be found of considerable interest to laymen. It is, however, a serious defect in a book issued in 1925 that the important subject of vitamins and the extent to which they are destroyed or damaged by food preservation methods is entirely ignored. Vitamins, indeed, are only incidentally mentioned.

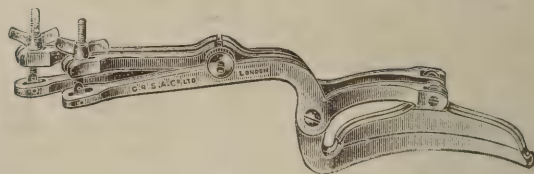
In other directions words with a technical meaning are used without adequate explanation, a defect if the work is intended for the uninitiated.

In scope the work is comprehensive and includes short accounts of the nature of the main types of manufactured and preserved foods. The causes of food spoilage are discussed, including those from insects and larger animals, micro-organisms, enzyme action, and physical and chemical conditions. The food preservation methods include simple storage, application of cold, dehydration, chemical preservation, preservation by fermentation, hermetically sealing, heat sterilisation, and pasteurisation. In the description of these processes the author follows customary lines, but here and there unusual pieces of information are quoted. For instance, it is mentioned that the United States Bureau of Fisheries during the war recommended the canning of dog-fish and other members of the shark family under the name of "grey-fish." When acted upon by many canners it was discovered that the flesh of sharks contained urea which decomposed in time to ammonia, spoiling the flavour of the product and swelling the container. This caused great loss to canners and illustrates well the importance of scientific knowledge in relation to food preservation.

New Inventions.

A NEW GASTRECTOMY CLAMP.

SURGEONS who have had practical experience of the modification of the Billroth I. gastrectomy operation introduced by Schoemaker of The Hague¹ will have found considerable difficulty in applying Schoemaker's crushing clamp to the stomach in certain cases. That instrument has to be passed across the stomach from the greater curvature, and where the ulcer is high on the lesser curvature, or the stomach not very mobile, it is sometimes impossible to apply the clamp sufficiently above the lesion. The clamp here illustrated is designed to extend the range of this



ingenious and physiologically admirable operation. It is applied from the upper border or lesser curvature of the stomach, with the inner and outer halves clamped together by the central milled screw and by an interlocking device at the tip of the blades. The two upper blades are set on a rocking joint so as to secure even crushing of the stomach, and the upper and lower blades are so ground as to fit into each other without risk of side-slipping or shearing the stomach wall. The crushing is effected by tightening the wing nuts on the ends of the handles. When the distal portion of the stomach has been cut away, exactly as in the Schoemaker operation, the outer blade is removed by simply releasing its wing nut and the central milled screw. I have found that this instrument simplifies the Schoemaker operation considerably.

I am indebted to Dr. K. B. Pinson, anaesthetist to the Manchester Royal Infirmary, for designing it, and it has been made for me by the General Radiological and Surgical Apparatus Co., Ltd., 204-6, Great Portland-street, London, W. 1.

JOHN MORLEY, Ch.M. Manch., F.R.C.S. Eng.

¹ Surgery, Gynecology, and Obstetrics, December, 1921, pp. 591-596.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 12, 1925.

THE TREATMENT OF FRACTURES.

THE important series of lectures by Sir WILLIAM DE COURCY WHEELER which has been appearing in our recent issues and terminates to-day, and the discussion on the subject at the meeting of the British Medical Association at Bath, have combined to awaken a widespread interest in the treatment of fractures, and especially in that treatment as carried out in our great hospitals and as taught to our students. That this treatment might be greatly improved no surgeon will deny, but as to how it should be improved opinions differ, and, broadly speaking, there are three schools of thought. First, there are those who would retain the present system of treatment in general wards by general surgeons; secondly, those who would treat these cases in a special department under general surgeons; and thirdly, those who advocate a department controlled by specialists. The first school claims that specialisation has already gone too far; that it is to the great general surgeons of the past that we owe most of our knowledge of fractures; and that, from the point of view of the student, the removal of these cases to a separate department would withdraw them entirely from his range of educational subjects—for no one would be found to suggest that intensive attention to fractures should form another special subject in the ordinary curriculum. The second school would seem to find a happy mean and to be in a very strong position, were it not that the third maintains that the general surgeons would never go near the fracture department, and that in any case the average general surgeon, despite his position on the hospital staff, often knows little specially about fractures or their treatment. And there is occasionally just enough truth in this final argument to give very serious point to their contention.

The matter might be left to academic discussion, when we can see directions in which entertaining debates would ensue, were it not that it is in reality one of the most serious problems of practical surgery at the present day. With the increase of machinery and of mechanical transport and the general speeding up of life the number of fractures has enormously increased. Their occurrence forms a serious item in the industrial problems of to-day, and, quite apart from individual considerations, their mismanagement may be a source of serious loss to the community. The vast majority of these cases will of necessity come to be treated neither by fracture specialists nor by general surgeons at hospitals, but by general practitioners who have so wide a range of professional and scientific duties that they can only pursue routine of the proper standard. The careful segregation of a few of these cases of fracture into special departments at the great teaching hospitals would certainly

raise in a proportional number of centres the level of routine, but such sporadic instruction would be a mere drop in the ocean of real need—namely, that our students in the mass should receive better instruction in the treatment of fractures. It is undeniably the case that the student cannot be well taught on cases which are badly treated, while at the present time the treatment of fractures in general surgical wards is often left entirely to the house surgeon, who cannot possibly have the knowledge required to do the best for the case, and whose unflinching enthusiasm will not supply the experience wanted. The present system, indeed, when closely examined, has practically nothing to commend it, for it is often unfair alike to the patient and to the student, whilst it is not unusual for a hospital surgeon, whose interest is attracted to other branches of surgery, to regard the fractures in his beds as mere encumbrances of the ground at his therapeutic disposal. A far better arrangement, and one likely to meet the reasonable requirements of all concerned, would be the setting aside of special wards for the treatment of fractures, to which the patients would be admitted under the charge of the various surgeons on the staff, but ensuring that these wards should be under the charge of a senior medical officer of the standing of a registrar, with an aptitude for the special work. The house surgeons of the different members of the staffs would look after the cases of their respective chiefs as they do at present, but their work would be carried on under the eye of this senior medical officer, to whose advice they would be expected to defer. The members of the staff really interested in the treatment of fractures would have the inestimable advantage of the assistance of an expert, whilst the student would be presented with an object-lesson in systematic treatment which he would be scarcely likely to forget. All the experience of the war in the treatment of fractures went to show how much better this was carried out when the cases were grouped together in one ward and under one control, and far from nursing being more difficult under these conditions, it became easier from the systematic arrangements which could be made for its requirements.

We think that these are the sound lines on which to employ and develop specialism in any important or more or less general branch of medicine, especially in those hospitals which are responsible for the training of our medical students. At the present time the student may be too much at the mercy of men of high scientific attainment, each of them convinced that his own is the only subject that matters. They may load him up with knowledge which would be worth its weight in gold if he could use it, but to him it is heavier than lead and just about as useful; and thus his frail barque, blown from one department to another, is finally wrecked by a brutal examiner who asks him practical questions. The fact that so many of our students succeed in arriving at port, and later in becoming really useful and practical men, says more for their power of endurance than for the wisdom of their educational training in many schools, though there are teachers in those schools whose devotion minimises the difficulties. It is undoubtedly to the specialist, willing to devote his energies to a limited field, that surgery owes some of its greatest advances, but it is from the teaching of the general clinician, the man who speaks from a wide experience spread over many branches of his art, that the student will learn the principles upon which he will ultimately rely. It is, we think, a matter for real regret that many surgeons have

become specially engrossed in other branches so as to lose sight of the importance of fractures, leaving their treatment to be carried out along unprogressive and uninspiring lines. Why this should be we cannot guess, for not only are the highest skill and ingenuity called for in the modern and special methods of this branch of surgery, but the cases requiring aid are increasing, and the general practitioner will need more assistance than he now gets from his training. Some such plan as we have suggested might help the student towards practical skill in a vital subject, and might bring back to the hospital surgeon a true sense of proportion and an appreciation of the exquisite art of which British surgeons were once justly proud.

FOOT-AND-MOUTH DISEASE.

AFTER the two abortive attempts which have been made to elucidate the mysteries of foot-and-mouth disease by appointing committees to make investigations, it is most encouraging to find that the third council, constituted as recently as March, 1924, under the presidency of Sir CHARLES SHERRINGTON, and later Sir WILLIAM LEISHMAN, is already in a position to issue a report¹ which sets out solid and substantial progress. The work has been done partly at the laboratories of the Ministry of Agriculture at Weybridge under the supervision of Sir STEWART STOCKMAN, and partly at the Lister Institute under Dr. J. A. ARKWRIGHT, who had experience of the disease in the ill-conceived attempt to work at it on a hulk in the Thames estuary. So far their observations have been confined to small laboratory animals, but by the adaptation of the Ministry's cattle testing station at Pirbright an admirable establishment has been secured where good facilities for exact work can be combined with a reasonable degree of isolation and experiments on pigs and cattle can be begun. This postponement of the direct attack on the disease in farm animals has not been without its advantages, since it has enabled attention to be concentrated on the means available for the identification of the virus and on its nature and properties, necessary preliminaries to the investigation of the main problems which are the mode of spread and the possibilities of protective inoculation.

It is curious that LÖFFLER and FROSCH, who found as long ago as 1897 that the vesicular fluid remained infective after it had been passed through a Berkefeld filter, failed to reproduce the disease in the small laboratory animals, for recent workers have all agreed that the guinea-pig may be infected with a regularity and certainty and with resultant lesions so characteristic that it is of the greatest value as a test animal. Almost any sort of inoculation gives positive results, but infection is best achieved by intracutaneous injection into the skin of the pad of the hind foot. After an incubation period of one to four days, redness and swelling appear at the site followed quickly by vesiculation. One or two days later symptoms of generalised infection appear; the animal is obviously ill; loses weight, there is often diarrhoea, and blisters appear in and about the mouth and on the fore-feet; appropriate experiments show that the virus is present throughout the body, mainly in the blood. As in cattle the mortality is low—about 5 per cent.—and the recovered animals are highly resistant to a second inoculation. This guinea-pig reaction is the only practicable means at present

available for identifying the virus. A rather limited series of experiments on other animals indicates that a proportion of white and wild brown rats can be infected with some difficulty and the long-tailed field mouse seems to be quite susceptible; with house mice, white mice, and fowls the results were negative. Attempts to transmit the disease by bugs failed, and epidemiologically it is very remarkable that infection is never transmitted from diseased to healthy guinea-pigs living together.

Using the guinea-pig reaction, most interesting observations have been made on the nature of the virus. It is present in abundance in the fluid of the vesicles, about 0.05 c.cm. of a 1 in 1,000,000 dilution being regularly infective. It dies in a day or two at 37° C., in the cold it survives for months, and if diluted vesicle fluid is rapidly dried over sulphuric acid it may remain potent for at least six weeks; infected tissues can be conveniently preserved in 50 per cent. glycerine, especially in the cold. As is well established, the virus readily passes through porcelain filters, and it is so small (or of such an abnormal gravity) that it cannot be concentrated by centrifugalisation; when in blood serum it is not entangled in the precipitates formed by precipitins or in the general coagulation of the proteids brought about by 60 per cent. alcohol. Nor are its dimensions or its substance of the nature which leads to its absorption onto the surface of particles such as red blood corpuscles, dead bacteria, or kaolin. Its resistance to ordinary killing agents is equally remarkable. In 60 per cent. alcohol it survives for 18 hours at room temperature, whereas *B. coli* and staphylococci are killed in a minute; in 0.5 per cent. phenol it lives for 21 days, and for two days in a saturated solution of chloroform in water; ether vapour does not kill in 36 hours, though 1 per cent. antiformin destroys it in an hour. Attempts to repeat the cultivation on artificial media reported by FROSCH and DAHMEN last year have failed even after a personal visit to Berlin, where Dr. ARKWRIGHT and Dr. S. P. BEDSON were freely shown the methods used by those workers. Such seems a common fate of much-advertised discoveries. The progressive transmission of the disease through guinea-pigs without loss of virulence seems then to be the only evidence that the virus is alive. Its other properties do not correspond with any recognised conception of living matter, nor is there at present any proof that it is particulate. It may, indeed, be a real *contagium fluidum* at last, and these researches are at least as important from this point of view as they may be as a beginning of gaining control over a disease which has been an intense agricultural nuisance for long enough.

THE PUBLIC HEALTH ACT, 1925.

THE Minister of Health has published a summary of the new Public Health Act which came into force on Sept. 8th.¹ The Act covers a wide range and much enlarges the powers of local authorities, though many of its provisions require adoption by the local councils before they come into force. They deal with many matters of housing, drainage, recreation grounds, and street planning, as well as with more strictly medical matters. The section on verminous premises, &c., enables the local authority, on a certificate of the medical officer of health or sanitary inspector, to cause verminous articles in any premises used for human habitation to be cleansed

¹ First Progress Report of the Foot-and-Mouth Disease Research Committee, Ministry of Agriculture and Fisheries. Stationery Office. 1925. 1s. 3d.

¹ H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2. 6d.

or destroyed at the public expense. The owner or occupier of verminous premises may be required to remove the wallpaper or take any other steps necessary for clearing the vermin. Any person notified as being in a verminous condition may be removed by his own consent to a cleansing station, or if he does not consent a petty sessional court may order his removal for cleansing. Women are to be treated only by a medical practitioner or a woman authorised by the M.O.H. The section dealing with infectious diseases provides a penalty not exceeding £5 for any person in whose dwelling a patient has died of such a disease if the owner of the dwelling fails to take reasonable steps to prevent persons coming into contact with the body. It enables a justice to grant the M.O.H. a warrant to enter a common lodging-house and examine its inmates if the existence of such disease is suspected; or the lodging-house may be closed by the petty sessions. The diseases included in the term "dangerous infectious disease" are those listed in the Notification Act of 1889. The list, therefore, does not include plague, cerebro-spinal fever, or dysentery, but it may be added to by the Minister at need. County councils and urban authorities are enabled by this Act to apply to a court of summary jurisdiction for an order for the removal to hospital of any person suffering from an infectious pulmonary tuberculosis and for his detention up to three months, even contrary to his wish. To safeguard the patient in such a case it is enacted that this power shall only apply where the accommodation prevents the adoption of adequate measures against the spread of infection and where it can be shown that there is serious risk to others. The period of detention may be extended a further three months if the circumstances are unaltered. Section 67 provides that any local authority may arrange for the publication of information on health questions and for lectures and display of pictures. Section 72 forbids the sale, preparation, or storage of foodstuffs in any room where a w.c. or sleeping place communicates directly or where there is inlet or opening from any drain. Dealers in rags and bones are not to be allowed to sell food or toys of any sort. The Act does not apply to London except in its ninth section, dealing with baths and washhouses. This part removes the statutory prohibition on mixed bathing. The amendments thus effected in the law are a preliminary step towards the much-needed consolidation of the Public Health Acts into a reasonable code.

TUBERCULOUS MILK: NEW REGULATIONS TO PREVENT HUMAN INFECTION.—The Minister of Health has introduced new regulations (H.M. Stationery Office. 1925. 1d.) investing local authorities with specific powers for the purpose of preventing the spread of infection by tuberculous persons handling milk. The enforcement of the regulations will be a matter for the local sanitary authorities; they forbid any person suffering from tuberculosis of the respiratory tract to enter on any employment or occupation which would involve the milking of cows, handling of vessels used for milk or the treatment of milk. Any such person can be required to discontinue his employment at a week's notice, with right of appeal to the courts. The new regulations to some extent remove the restrictions imposed on local authorities in cases of notified tuberculosis. Authorities are urged, however, to make every effort to preserve the confidential character of notifications as far as is consistent with the due exercise of the new regulations. The medical officer of health is required to take all reasonable steps, including expert clinical and bacteriological examination, to be sure that the suspected person is really suffering from tuberculosis.

Annotations.

"Ne quid nimis."

VOCATIONAL TESTS.

THE familiar question "What shall we make of the boy?" has usually been settled in the past by family conclave, modified by financial considerations, the desire of the father either for a successor in his business or to see his son succeed in some line of life where he himself has failed and, to an increasing extent in recent times, by the expressed wish of the child himself. In the near future it is not so certain that any of these factors will have a place in the selection of a career. The psychological expert will be called in to settle the matter by the standardised tests that are already being used extensively in America and on the continent. In Germany, for instance, such firms as Osram, A.E.G., Siemens, Krupps, and the Post Office and State railways have established psychological laboratories in which their new employees are tested before being allocated to the various branches of the firm's activities. Several large firms in this country also have sought the aid of the National Institute of Industrial Psychology in instituting definite psychological tests. A committee of the British Association under the chairmanship of Dr. C. S. Myers drew up a report for presentation to the Psychological Section at Southampton. The report reviews the present position of vocational testing and asks for a grant towards the expenses of a systematised research into the subject. The committee say that:—

"In order to define the position of psychological tests in schemes of vocational guidance and selection it is important to realise that the school records give only one side of a child's mental or physical activities. The records are obtained under conditions very different from those obtaining in the outside world, and their value must be estimated accordingly. In the same way a teacher's estimate of a child's ability is only valid within his sphere of observation; similarly with the estimates of parents and guardians. The medical examination can give help mainly in determining for what occupations a child is not fitted. In this sphere there is an enormous ground to be covered before valid positive information can be obtained. Psychology can help in forming a truer estimate of the value of the children's own wishes and inclinations in determining a choice of occupations, and it can survey more completely and exactly than any other method the child's mental and physical activities. Psychological tests can be applied which will ascertain, for instance, his level of intelligence, measure his manual dexterity, and to a certain extent estimate his temperamental qualities. This information is, however, of little use unless the extent to which these qualities are required in everyday occupations has also been determined, and this implies a careful analysis of the requirements of the occupations and a classification of those requiring allied ability. When such information is available reliable advice can be given.

"With the rapid development in this work that has taken place during the last few years, there has arisen a demand for persons who have received training in the methods of devising, applying, and evaluating suitable tests, and a number of bureaux have organised training courses for those who wish to take up this work. In nearly every country of the world the work of developing vocational tests is proceeding rapidly, and it is felt that in order that workers in this country may keep abreast of the developments here and abroad, full information should be available concerning: (1) vocational tests that have proved of value in practical use; (2) research work that has a direct bearing on the development of vocational tests. In order to do this satisfactorily it will be necessary to get in direct touch with all organisations carrying out this work and to obtain, wherever possible, copies of the tests, accurate descriptions, drawings, and illustrations of apparatus used, &c."

There can be no doubt of the value of such research. Those who believe that the true vocation of the best type of worker is indeed "a call," strong enough to drive the individual to his destiny over all obstacles, must nevertheless admit that to many men such an experience comes late if at all, and any laboratory process that can reduce the number of square pegs fitting clumsily into round holes is bound to increase the well-being of the community as well as the sum total of individual content.

THE NEW CENTRAL PHARMACOLOGICAL LABORATORIES.

THE plan to establish new pharmacological laboratories at the headquarters of the Pharmaceutical Society¹ has reached the stage at which a director is being sought, and in all probability the laboratories will be fully equipped and staffed before the Therapeutic Substances Act comes into operation. The detailed arrangements and the lines on which the scheme will develop will not be determined until the director has been appointed, but we understand that it is the intention of the Pharmaceutical Society that commercial testing as well as research work in pharmacology shall be commenced at the earliest convenient time. The director will be given a free hand in the choice of equipment and in the selection of his staff, and while the whole of the work of the laboratories will be under the supervision of the director the routine commercial testing will be left as far as possible in the hands of competent assistants, freeing the director to carry out researches. We have inspected the four laboratories that will be placed at the disposal of the director, and this accommodation would appear to be sufficient for some time to come, but if the work develops to the extent that is hoped it may be necessary, in due course, to provide further premises. It is probable that in the earlier period the work will be confined to the physiological standardisation of drugs such as digitalis, strophanthus, and ergot, these being typical examples of drugs which cannot be standardised by chemical means, and that the standardisation of vaccines and sera and similar substances will be deferred until a later period in the development of the scheme. This, however, is a matter for future decision. Commercial testing for firms which are not in a position to undertake the testing of the products which the Therapeutic Substances Act will require to be standardised is not likely to cover the cost of the laboratories, and indeed it is not intended that the laboratories should be self-supporting. The advisory committee, which includes Sir Nestor Tirard, Dr. H. H. Dale, and Sir Humphry Rolleston, will assist the Council of the Pharmaceutical Society in selecting the director.

THE DENTAL SERVICE IN THE U.S. NAVY.

THAT the care of the teeth of the men of the U.S. Navy obtains, and rightly, grave consideration from the officers of the Medical Corps, is evidenced by the issue of a "Dental Number" of the *U.S. Naval Medical Bulletin* (for April). The Surgeon-General, in his recent annual report, observed that there is now in actual service one dental officer to every thousand men, but that the establishment, if attained, would provide one officer to 615 men, although, in his opinion, there should be one for each five hundred. The actual work of officers of the Dental Corps is much lightened by the help given by the naval dental assistants or dental technicians (selected from the sick-berth staff and trained specially for 16 weeks), who act as "oral hygienists"; they clean mouths, do scaling, and give patients individual teaching besides assisting the dental officer in the management of apparatus, the sterilising of instruments, and so forth. The importance of the work done at naval training stations, where recruits are received, is shown by the experiences reported from one of them, where, of 4337 recruits examined and charted in six months, 3016 were found to require treatment; 1246 teeth were extracted, 6314 cavities found, and 1040 fillings done, while 5274 fillings were left over to be carried out in rotation on board ship. A dental ward of 12 beds has been opened in the naval hospital at Norfolk, Virginia, with complete annexes for dental work. It is there recognised that the dental officer's first duty is that of "prophylactodontist," especially before operations requiring general anaesthesia, and

in syphilis. His next care is the elimination of dental focal infections, which may lead to systemic sequelae, such as rheumatism, gastro-intestinal disorders, diseases of eye, ear, nose, antrum, and skin. Lieut.-Commander J. R. Barber, Dental Corps, U.S.N., has devised a scheme of routine for the dental examination and treatment of the men of small craft arriving at the New York Navy Yard for refit; this has worked well and is mentioned with approval. The men are all examined on arrival, those requiring treatment are listed, and the list is sent to the captain, who daily releases for treatment as many men as he can spare from duty. A new list is sent next day, and so on, till all are put right.

A STANDARD FOR MATERNAL MORBIDITY.

LITTLE progress can be hoped for in dealing with what is still commonly called puerperal fever unless the condition is accurately defined. In 1905 the British Medical Association laid down a definition of puerperal morbidity and recommended that it should be adopted as a standard by the medical profession. Although this standard has been largely accepted its general adoption has not been universal. This lack of uniformity is well brought out in comparing the clinical reports of various maternity hospitals and charities. There is the more stringent Queen Charlotte Hospital standard which in some quarters is preferred to that advocated by the Association. Several hospitals have invented entirely new definitions of their own, whilst others have failed to interpret the B.M.A. prototype correctly. We have before us the medical report for 1924 of the British Hospital for Mothers and Babies at Woolwich, the authors of which show two sets of figures "in the absence of any generally accepted standard of morbidity-rate." These are based on the number of deaths which have shown a temperature of (1) over 100.4° F. for 24 hours or more, and (2) over 100° for less than 24 hours. It is a matter of serious concern when an institution as admirable and reliable as the British Hospital at Woolwich denies the existence of a standard of puerperal morbidity; it means that it is impossible to compile any statistics on the subject whatever. Obviously, if we are to avoid absolute chaos, the B.M.A. enactment should be adopted in toto or a new formula should be drawn up more in accordance with the views of obstetrical authorities both in this country and abroad. If the latter course were adopted the various international statistical returns on morbidity could be compared and some idea obtained of the incidence of puerperal infection and the relative value of the many forms of treatment carried out. Could not the medical statisticians associated with the League of Nations draw up a memorandum on the subject and arrange a standard in conformity with the opinion of the leading obstetricians of their respective countries?

THE ANÆSTHETIC PROPERTIES OF PROPYLENE AND ACETYLENE.

SINCE Luckhardt and Carter published in 1923 their discovery of the value of ethylene as an anaesthetic, several experimenters have investigated its homologues. The physical properties of propylene suggested that it would prove a more powerful and safer drug than ethylene. Brown, Meyer and Hopff, and Riggs have experimented with it, and we published recently the report of Dr. F. E. Shipway¹ on this and other new gaseous anaesthetics. The August number of *Anæsthesia and Analgesia*, the publication of the International Anæsthesia Research Society, contains the record of experiments by Prof. J. T. Halsey, Mr. C. Reynolds, and Mr. W. A. Prout at New Orleans. They have found an initial difficulty in obtaining pure propylene, but when this has been overcome rapid and comfortable narcosis can be produced in animals and man by a concentration less than one-half of that required with ethylene.

¹ THE LANCET, June 6th, p. 1192.

¹ THE LANCET, 1925, i., 1126.

Death does not result till a concentration 150-160 per cent. of the anæsthetic dose is reached and is usually due to simultaneous failure of the heart and respiration. In animals it was not possible to obtain complete muscular relaxation, but an analgesia sufficient for clinical purposes resulted from concentrations of 40 to 50 per cent.; at which strength there seemed to be no harmful effects and no toxic sequelæ. The authors conclude that propylene may prove of value in anæsthesia, but this can only be determined by cautious clinical trials made by experienced and competent anæsthetists with careful attention to exactness in dosage. The same publication contains a note by Mr. A. Goldman, D.D.S., and Mr. J. D. Goldman, D.D.S., of New York, on acetylene-oxygen anæsthesia. This combination has been extensively tried in Germany. The American investigators have experimented with white mice and conclude that anæsthesia can be maintained with percentages of oxygen much higher than that in air and that the symptoms of danger (gasping) are readily recognisable and appear early enough before respiration ceases for the animal to be easily brought back into safety. The safety margin is much more favourable with commercial acetylene and oxygen than with either ethylene and oxygen or nitrous oxide and oxygen. Dental operations conducted under this anæsthesia were very successful, the subject retaining good colour and returning to consciousness with a hearty appetite ten seconds after the apparatus was removed. It is important to get the acetylene pure; German investigators claim to have freed it from all trace of phosphine and sulphur, but the American workers did not succeed in getting less than 0.0003 per cent. of phosphine and 0.002 of sulphur.

INTESTINAL NEURO-DYSPEPSIA.

UNDER this title Prof. Arturo Campani, of the University of Modena, publishes a description¹ of a syndrome which, though clearly defined, is slight in its effects on the bodily organism, and perhaps on this account liable to be confused with myelasthenia, disturbances of metabolism, or chronic enterocolitis. According to Prof. Campani the malady consists of a stable and characteristic group of fundamental symptoms which are deserving of special study and nomenclature. These manifestations are: (1) Insomnia of a peculiar kind, the patient sleeping soundly till 2 or 3 A.M., then waking with a sense of heat, sweating, and borborygmus. Sleep is resumed with difficulty. (2) Disturbance of intestinal digestion characterised by changes in the rhythm of defæcation, sometimes spasmodic constipation, but more often slight tendency to diarrhoea or to repeated and copious evacuations. (3) Retardation of morning digestion, the patient having no inclination for food after the mid-day meal. (4) An eruption on the dorsal surface of the fingers sometimes so slight as to escape notice unless carefully looked for, characterised by guttate desquamation of the epidermis over the second and third phalanges, with irritable redness of the underlying dermis, more or less evident erythema, never severe, dry, with slight tendency to fissures. Not infrequently the skin of the phalanges is less pigmented and becomes smoother than the rest of the hand. (5) Tingling on the arms and head, retinal hypersensitiveness, muscæ volitantes. (6) Increased plantar and skin reflexes. (7) Tolerance towards adrenalin, intolerance towards belladonna even in small doses. This group of symptoms which form the syndrome is often accompanied by accessory manifestations such as polyuria, hand tremors, and irritability of temper; true psychasthenia, however, is never found. The general health suffers but little; there is not rarely a history of phosphaturia in youth which disappears with the progress of years and develops into a tendency to urinary hyperacidity and calciuria. This syndrome rarely makes its appearance before the age of 40 and is almost confined to the male sex. Its cause may lie in some functional disequilibrium of the endocrine

glands causing sympathetic and vagal hypotonus; it usually ceases when true old age is reached. Further elucidation is required to settle what glands or group of glands are most implicated; the disturbances of calcium metabolism and the cutaneous pigmentation seem to suggest a slight suprarenal insufficiency, and Prof. Campani thinks that the cutaneous nervous and intestinal signs have some remote resemblance to pellagrous conditions. Treatment is best directed to elimination from the diet of sugar, cream, chocolate, and sweet farinaceous foods, and to reduce the evening meal to a minimum. Bromide of sodium may be given as an intestinal antispasmodic, and some good effects have resulted from the administration of preparations of lime together with adrenalin.

THE ICONOGRAPHY OF VESALIUS.¹

IN 1912 Prof. Dr. Paul Heger, now president of the University of Brussels, originated a scheme to produce a Liber Memorialis in honour of Andreas Vesalius, to commemorate the fourth centenary in 1914 of the birth of the father of modern anatomy. A subsidy was promised by the Belgian Government and a select band of scholars was chosen to collaborate. Of this project, including biographical, historical, and scientific and iconographic sections, only the last section, which was placed in the competent hands of Mr. M. H. Spielmann, F.S.A., has come to fruition. With the active assistance of Prof. Heger, Mr. Spielmann was able to complete his section, which was set up in type before the other essays were completed. Then came the war, and the whole matter was suspended. After the war it was found impossible to proceed with the scheme, for everyone was more occupied with the future than with the past, and of the band of scholars who had been entrusted with the other sections not less than four had fallen victims to the war, either directly or indirectly. But it was decided to publish the iconography, which was first written in French, the English version being published under the auspices of the Wellcome Historical Medical Museum, forming No. 3 of the series of Research Studies in Medical History. The work is in every way worthy of the distinguished anatomist; we doubt whether so complete an iconography of any one individual has ever before been compiled. Mr. Spielmann has omitted nothing which can throw light on his subject. He deals with portraits in oils, pictures, engravings, illustrations, sculpture, and medals; there are numberless illustrations most admirably reproduced and an iconographic bibliography which is a model of what such things should be, while Mr. Spielmann's critical and literary notes are of extreme interest. The portrait of Vesalius which is the source and ground of all others of him, either directly or indirectly, is the well-known woodcut, dated 1542, which appears in the first edition of Vesalius's great work, *De Humani Corporis Fabrica Libri Septem*, published at Bâle in June, 1543. The drawing was done by Calcar, but the name of the wood-cutter to whom he entrusted the drawing is unknown, although he was evidently a master of his craft. There are 29 known portraits in oils of Vesalius, or at least claiming to represent him, but of these Mr. Spielmann considers that only nine can be reasonably regarded as true representations. One of them is no longer in existence, although it was so when Mr. Spielmann wrote of it, the famous picture which used to be in the University of Louvain. Besides these oil paintings there exist numerous engravings both of Vesalius alone and showing him demonstrating before an audience, the chief of these latter being the title-page of the *Fabrica* of 1543. Sculptures and medals are dealt with in the latter portion of the iconography. Of no man of science, we may say, are there so many graphic illustrations as of Vesalius, and when we consider that among the artists are such men as

¹ The Iconography of Andreas Vesalius, 1514-1564; with Notes, Critical, Literary, and Bibliographical. By M. H. Spielmann, F.S.A. London: John Bale, Sons, and Danielsson, Ltd. 1925. Pp. 243. 30s.

² La Riforma Medica, April 27th, 1925.

Titian, Tintoretto, and Moroni, it is evident that his fame is not posthumous alone. Artists and medical men, together with historians, owe a debt of gratitude to all the begetters of this book.

PATHOLOGICAL INVESTIGATION IN SCOTTISH MENTAL HOSPITALS.

IN Scotland the effort to centralise and develop the study of mental pathology is continuing. The Board of the Scottish Asylums Pathological Scheme report that Dr. F. E. Reynolds has been appointed superintendent of the laboratory with recognition as lecturer in neuropathology to Edinburgh University—a most valuable combination of posts. Dr. Reynolds visits the contributing asylums periodically to advise and encourage the work carried on by individual medical officers, and is himself conducting researches into the paths of infection of the leptomeninges. The laboratory undertakes such routine work as may be desired by the 21 hospitals supporting the scheme, and supplies them with printed forms for description of specimens and circulars explaining the best methods of taking, despatching, and preserving material. A similar scheme is in force in the West of Scotland. It is reckoned that a contribution at the rate of six-tenths of a penny per patient from each of the seven bodies concerned in the scheme would make the financial basis sound. Dr. W. Whitelaw, director of the research institute in Glasgow, reports a steady increase in the routine work done, from 450 specimens in 1921 to 2006 in 1924. Owing to epidemics of typhoid fever at Hawkhead and Greenock Asylums, a large proportion of these specimens were examination of excreta for *B. typhosus* or of blood for Widal reaction. The epidemic at Hawkhead seems to have been present since 1916, but has undergone exacerbation since 1921. Twelve carriers in all have been isolated, and Dr. Whitelaw is of opinion that typhoid will come to occupy the position that dysentery once held if drastic steps are not taken to deal with it. He urges the importance of early recognition and early isolation. Research has been undertaken on blood-sugar in anxiety states, on the calcium content of the blood in epilepsy, and on the cerebro-spinal fluid in general paralysis which is being treated by protein shock; but it is too early yet to formulate conclusions. A number of medical officers have been examining the relation of chronic infection, especially intestinal toxæmia, to certain mental disorders. Treatment by intestinal disinfectants has not yielded any useful results. Dr. J. Neilson, a McCunn scholar, is working on the histology of encephalitis lethargica. Certain post-mortem material is being investigated with special regard to the associative mechanism, and Dr. Whitelaw appeals for material from dementia præcox cases. It is clear that while valuable work is being done by these two Scottish schemes, there is still ample scope for extension and improvement.

THE LATE DR. J. DE ZOUCHE MARSHALL.—John James de Zouche Marshall, L.R.C.S. Irel., Lieut.-Colonel, R.A.M.C. (T.), died at his residence in Hove on August 24th at the age of 78. Born in Limerick, he was educated in Dublin, studying medicine at the Royal College of Surgeons in Ireland, where he qualified L.R.C.S. Irel. in 1869, L.A.H. in 1870, and L.M. (Coombe Lying-in Hospital) in 1871. His professional life was spent in England, at Surbiton, Esher, and Hastings, until his retirement some eight years ago, when he took up residence at Hove. While in practice he actively identified himself with the Volunteers, and then with the Territorials in the Royal Army Medical Corps, to which he devoted much of his time and energy. He rose to the rank of Lieut.-Colonel and received the Volunteer Decoration. He commanded the 3rd Home Counties Field Ambulance, was lecturer and examiner to the St. John Ambulance Association, and at one time served in that capacity to the Metropolitan Police. He contributed a number of articles on ambulance work and allied subjects to medical literature. Although in later years declining health prevented him from taking an active part in the affairs of the St. John Ambulance Association, he followed the work of the movement with a never-failing interest.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXVIII.—THE TREATMENT OF PAPILLOMA OF THE BLADDER.

OF the various methods of treatment of papillomata of the bladder, only two will be considered here; in one, the tumour is burnt or coagulated by the passage of an electric current at high voltage, contact being effected by an electrode introduced through a catheterising cystoscope, the method being known as fulguration; in the other, the tumour is removed by operation through a suprapubic incision. The old treatment of washing out the bladder with solutions of various drugs is not curative, and the removal of growths with the operating cystoscope is not advised for reasons which will be clear later.

Two Lines of Treatment.

Each form of treatment has its advantages and disadvantages, and what is suitable for one tumour may be unsuitable for another. Each case must be judged on its merits, and, while no hard and fast line can be drawn, the following points should be taken into consideration when deciding which is the better method for any given patient.

Fulguration possesses these advantages. It can be done without a general anaesthetic, and the patient need only be confined to bed for a day or so, and in many cases not at all; it is therefore valuable for patients for whom a general anaesthetic is contra-indicated or who prefer a cure without a "cutting" operation. It is suitable only for growths which are undoubtedly simple, relatively small, and not numerous; mere multiplicity, however, is no contra-indication, provided the total bulk of the tumours is not too large. It is of the greatest value in dealing with the small recurrences or implants which so frequently occur after the cure of an original papilloma. Experience has shown that there is a somewhat less risk of the occurrence of secondary seedlets on the vesical wall after fulguration than after suprapubic removal.

The disadvantages of fulguration are as follows. As the process of coagulation is slow, the procedure required for the complete destruction of a tumour, unless of small size, is often a lengthy one, frequently several sittings being required, especially when no general anaesthetic is employed. Fulguration is unsuitable for tumours that are sessile, as it is difficult to be sure of their non-malignancy, owing to the impossibility of determining for certain with the cystoscope the absence of infiltration of the vesical wall. It is unsuitable for tumours that are large or very numerous, owing to the number of sittings required and sometimes to the field of operation being obscured by the imbedding of the end of the cystoscope in portions of the growth. Lastly, it is unsuitable for cases in which hæmorrhage occurs on the least provocation and cannot be controlled; hæmorrhage of this type is most likely to take place when the end of the cystoscope butts into and traumatises the growth, which is often near the internal meatus or of large size. Fulguration is difficult to employ when tumours are situated in certain inaccessible positions, such as close to the internal meatus, on the antero-superior surface, and at the back of the retroprostatic pouch.

Removal by suprapubic cystotomy has the advantage of enabling the tumour or tumours to be eradicated at one sitting, and is indicated when the question of non-malignancy is in doubt, or when the tumour is sessile or of large size. It is the only form of treatment for the radical cure of definitely malignant growths, as by its means those tissues which are infiltrated, including portions of the vesical wall

of varying extent, can be removed with the tumour. Furthermore, the suprapubic exploration of the bladder affords the only means of determining accurately the presence of infiltration in the earlier stages and the extent of it in the later.

Removal by suprapubic cystotomy has the disadvantage of subjecting the patient to a major operation with its attendant risks and complications and to a period of post-operative convalescence. Generally it is possible to suture the suprapubic vesical wound completely and, in the majority of cases, to obtain primary union without a urinary fistula; in favourable cases, therefore, the patient is confined to bed for a fortnight, while in those in which a fistula occurs, the wound will take from three to six weeks to heal. The occurrence of secondary seedlets is more common after this method of treatment than after fulguration, but is in part probably due to the more serious tumours being dealt with by this method. Recurrences, however, do take place not uncommonly in the suprapubic vesical scar and rarely in the scar of the abdominal wall.

In deciding which is the method of choice in a given case, in addition to the above considerations, due regard must be given to the temperament of the patient, his ability to attend for treatment, and his own views on the matter. Some surgeons are more strongly in favour of fulguration and others of removal by suprapubic cystotomy.

Of all the points to be taken into consideration, the determination of the innocence or malignancy of the tumour is the most important, and is often difficult. The signs suggesting malignancy are—the presence of sloughs or phosphatic deposits on the surface of the tumour; a ragged and torn appearance of its villous processes; the absence of a narrow pedicle; the presence of infiltration, which is responsible for a diminution of the normal vesical capacity and for the symptom of frequency; and the presence of a tumour on bimanual examination of the pelvis.

Whichever method is adopted, however, some important pathological properties of vesical papillomata must be borne in mind. First, the ease with which cells of, or portions of, the tumour will implant themselves, and grow, on the apparently intact mucous membrane of the bladder and in other tissues of the host; secondly, the frequency with which multiple tumours occur; thirdly, the frequency with which other and similar growths appear in the bladder months or years after the complete removal of the first; fourthly, the vagueness of the line of demarcation between a simple and malignant tumour, and the fact that a simple papilloma sooner or later usually becomes malignant if untreated. It is clear, therefore, in treating papillomata of the bladder that as far as possible living cells or portions of the tumour should neither be allowed to come in contact with the vesical wall or other tissues of the patient nor be left behind lying free in the bladder, and that, after the cure of one papilloma, the bladder, even in the absence of symptoms, should be examined with the cystoscope every two, or at most three, months at first, and later every six months, over a period of many years.

Technique of Fulguration.

The employment or otherwise of a general anaesthetic varies with the practice of different surgeons. Its use may enable a growth which would otherwise require several applications to be destroyed at one sitting; moreover, the surgeon's attention is not distracted by the thought of giving the patient pain or discomfort; on the other hand, its use adds a definite risk, small though it is. Without a general anaesthetic, the duration of the treatment is limited by the fatigue of the patient induced by the presence of the cystoscope in the urethra, by the discomfort of the distended bladder, and by the pain caused by accidentally touching the sensitive trigone; moreover, the patient, and to some extent the surgeon,

are under mental tension throughout. Generally speaking, the smaller the growth, the older the patient (the bladder and urethra being less sensitive in the aged), and the more stolid he is, the less the desirability of a general anaesthetic.

One terminal of the apparatus is connected to a malleable metal plate, which is firmly bandaged to the thigh, suprapubic region of the abdomen, or back. The bladder is gently distended with fluid, the catheterising cystoscope introduced, and the electrode, connected with the other terminal of the apparatus, inserted into the cystoscope. To prevent living cells, or living portions, of the tumour from becoming detached during the subsequent procedure, the surface of the growth should as far as possible be dealt with first. The electrode is gently pushed on to the tumour so that its point lies among the villous processes and in contact with them, and the current turned on. In a few seconds the part of the growth immediately around the electrode turns white, then black, and a little later bubbles begin to appear accompanied by a sound of fizzing and the appearance of an arc. As little arcing as possible should be allowed to occur, and on its appearance the electrode is withdrawn a little, the current switched off, and the procedure repeated at a fresh place. It is important during the withdrawal of the electrode to avoid as far as possible the risk of pulling off pieces of living growth, as, apart from the theoretical objection of liberating living tumour cells, hæmorrhage is liable to be produced; this risk is lessened by keeping the current switched on during the withdrawal; portions of coagulated tissue will, however, often become firmly glued to the electrode and will come away with it. In the case of the smaller tumours the whole growth and its pedicle can in a short time be destroyed in this manner; it is, however, essential to treat a small area of apparently normal mucous membrane immediately surrounding the place of origin of the tumour in the same way; in the case of the larger pedunculated tumours, time can often be saved by cutting through the pedicle, a procedure, however, only to be adopted after the surface of the growth has first been coagulated.

During fulguration the electrode has to be removed frequently and its point scraped free from the pieces of coagulated tissue which become firmly adherent to it and prevent the conduction of the current; from time to time, too, the fluid in the bladder must be changed, partly because of its rise of temperature, which is considerable if much sparking has been allowed to occur, and partly because of its diminution in translucency caused by the presence of blood and particles of coagulated tissue. Should bleeding occur, it can usually be stopped by leaving in the bladder for a few minutes some fluid containing one or two ounces of 1 in 1000 adrenalin solution.

Sometimes, in treating a papilloma growing in the middle line of the trigone, difficulty is caused by the repeated accumulation of bubbles on the lens of the cystoscope obscuring the view; the difficulty can be avoided by turning the patient on his side.

Papillomata growing on the anterior vesical wall, usually recurrences in the scar of a previous suprapubic cystotomy, may be brought into closer relationship with the electrode by an assistant placing his hand on the suprapubic region and pressing backwards the anterior abdominal wall and by only partly filling the bladder with fluid.

If fulguration is carried out under a local anaesthetic, half an hour is about as much as the patient will tolerate, while if under a general anaesthetic, it can be continued for say an hour and a half, but has then to be stopped, sometimes owing to fatigue of the surgeon, sometimes to hæmorrhage obscuring the field of operation, and sometimes, after the whole surface of the tumour has been coagulated, to the necessity of awaiting the separation of the sloughs before the amount of living tumour remaining can be determined.

At the end of the sitting the free sloughs are evacuated with a Bigelow's evacuator, and some

surgeons wash out the bladder with a 1 in 10,000 silver nitrate solution with the object of killing any loose living tumour cells.

Post-operative treatment calls for no special comment. Some urethral discomfort from the presence of the cystoscope in the urethra is usual and a little hæmaturia may occur, but is not severe. In cases in which the tumour or tumours cannot be completely destroyed at one sitting, the next treatment should be undertaken three weeks or a month later. If at the second sitting it is found that no marked diminution in the size of the growth has occurred, its non-malignancy is in grave doubt.

Technique of Suprapubic Removal.

The patient is given a general anæsthetic and the bladder gently distended with fluid. A long paramedian incision is made, extending from the symphysis pubis to the umbilicus or above, the rectus sheath opened, and the peritoneum stripped off the anterior wall of the bladder as far upwards as practicable. To avoid the possible contamination of the wound with living tumour cells which might perhaps be suspended in the fluid, the bladder may now be emptied by the catheter left in situ for the purpose. The patient is put in the Trendelenburg position and the bladder opened by a long vertical incision in its anterior wall. The wound, shielded with rubber pads, is held widely retracted in a good light. Thompson Walker's self-retaining illuminating retractor is useful. Any fluid remaining in the bladder is removed either by a suction tube or by pieces of gauze, care being taken not to touch the papilloma. The amount of infiltration of the vesical wall, if any, must be determined. It is wise as a first step to destroy the whole surface of the tumour with the benzoline or electric cautery or the diathermy apparatus. In the case of the smaller growths, their complete destruction and that of their pedicles and adjacent vesical mucous membrane can be accomplished in this way. In the larger but pedunculated growths, the root of the pedicle is seized with suitable forceps, after the preliminary cauterisation of the surface of the growth, and the tumour with a portion of the normal vesical mucous membrane cut or burnt away; the seizing of the tumour itself with forceps should never be done, as it will almost certainly cause hæmorrhage and the tearing off of portions of the growth. In dealing with the larger but sessile tumours and with those in which infiltration has occurred, a piece of the whole thickness of the vesical wall should be removed with the tumour by means of the knife or cautery, the line of section being kept well clear of the infiltrated tissue. The resulting wound, if made by the knife, is sutured with catgut after ligating the bleeding points, but if made by the cautery is best left to granulate after separation of the sloughs; should the whole thickness of that part of the vesical wall which is covered by peritoneum need to be removed, the knife should be used and the wound carefully sutured. If the tumour is growing on or near a ureteric orifice, no hesitation need be felt in removing that orifice or even a portion of the ureter itself if necessary. In many cases the vesical mucous membrane upon which the papilloma has been resting is dark red, granular, and velvety; the whole of the area thus affected should be cauterised. If thought desirable, the bladder may be washed out with a solution of silver nitrate. Some surgeons prefer to close the suprapubic vesical wound completely, drainage being established by a catheter tied into the urethra for a few days, while others prefer to provide suprapubic drainage; generally, suprapubic drainage is unnecessary unless hæmorrhage is incomplete; but sometimes secondary hæmorrhage occurs during convalescence when the sloughs separate, and occasionally is so free as to necessitate reopening the suprapubic wound.

During convalescence the urine should be kept acid and the patient given hexamine, and it is as well to commence the use of this drug a day or so before

operation. Whether the patient is submitted to bladder washes or not depends on the practice of different surgeons. In the majority of cases in which suprapubic drainage has not been adopted, the wound heals per primam, and the patient is out of bed at the end of a fortnight; in those in which a suprapubic fistula occurs, the wound closes in from three to six weeks.

At the subsequent cystoscopic examinations very careful inspection should always be made of the suprapubic vesical scar, as recurrences in that situation are not uncommon.

For the undoubtedly malignant tumours an operation planned on the lines indicated above should be performed, a more or less extensive area of the whole thickness of the vesical wall being removed, the procedure amounting to a partial cystectomy. Inoperable cases are of two types. In one the bladder is filled with a mass of papillomatous growth; the only radical treatment is total cystectomy, an operation having so high a mortality that it is rarely performed; sometimes the whole mass of the growth is curetted out and the bladder cauterised, a procedure which, besides causing severe hæmorrhage difficult to control, is almost certain to be followed by recurrence. In the other type the growth invades the extravascular tissues, producing a large, firm, fixed pelvic mass. For both types, in addition to the treatment of symptoms, radium may be employed with advantage; sometimes the patient's existence is so miserable that it is advisable to put the bladder out of court by a bilateral ureterostomy, the ureters being either brought to the surface or inserted into some part of the intestinal tract.

B. C. MAYBURY, F.R.C.S. Eng.,
Surgeon to Out-patients, St. Thomas's Hospital.

Obituary.

JOHN DARLEY WYNNE, M.B.,
B.Ch. Dub., D.P.H.

Dr. J. Darley Wynne, who died on August 4th in Guernsey, was the second son of the late Right Rev. F. R. Wynne, D.D., Bishop of Killaloe. He was educated at St. Columba's College and graduated in arts and medicine at Trinity College, Dublin, gaining the Hudson prize and silver medal of the Adelaide Hospital. He began his medical career in Sheffield, where he was for a time house surgeon to the Jessop Hospital for Women. He was afterwards medical officer to the Nottingham Borough Fever Hospital, and having also gained experience of general practice in that city he returned to Ireland and was for many years one of the leading practitioners in Clonmel, Co. Tipperary. It was during this period that he turned his attention to public health matters, and took with honours the diploma of the Irish Royal Colleges. He was one of the pioneers of the special study of tuberculosis in Ireland and published several papers on the subject, one of which on the Connexion between Cattle Fairs and Tuberculosis in Ireland was an important piece of original observation. Another paper on Dr. Johnson and the Medical Profession was the outcome of a discerning knowledge of English literature. After a severe illness Dr. Wynne left Ireland and took a country practice in Norfolk, but continued ill-health compelled him to seek less strenuous work in Guernsey where he died. In spite of physical disability he remained a hard worker and a keen sportsman almost up to the day of his death; in fact, the final failure of his heart seems to have been determined by a bathe in the sea three days before he died. Yachting, boat-sailing, and swimming were his recreations, and he never lost his love of them. To those who knew him best he was a man who had not lost the charm of youth in spite of ill-health, and he is still remembered with affection by his old colleagues in Sheffield and elsewhere. He leaves a widow and three children.

STUDENTS' GUIDE—SESSION 1925-26.

DENTAL SURGERY.

(Concluded from p. 519.)

TEACHING INSTITUTIONS IN DENTISTRY.

OF teaching institutions those connected with the several universities have now been described in some detail, but in addition to these there are a number of institutions which offer facilities to dental students and which are here set out under their localities.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London. Women are now admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for four months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. The "Lonnon" Bursary of £25 for second year students. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10s. in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £52 10s. Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science or Pre-Medical Examination £13 13s. The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A

calendar containing full information as to lectures, fees, prizes, &c., may be had on application to the Sub-Dean for Dental Students, who attends the Hospital on Monday mornings at 10 o'clock.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It has a floor space of over 6000 square feet, and affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in July of each year, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Junior Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

Appointments: All appointments are made according to the merits of the candidates, as determined by a committee of the Dental Staff. Eighteen house surgeons, 15 assistant house surgeons, and 15 clinical assistants, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, orthodontia dresser, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and ordinary extraction rooms, and probationary dresser.

King's College Hospital.—The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-patient Department of the Hospital is used for the performance of dental extractions. A large Conservation Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in the art of dental mechanics. An X ray apparatus has been installed for special use in dental skiagraphy. A museum containing a large number of specimens

illustrating oral, buccal, dental, and other diseases is available for teaching purposes. The library, lecture theatre, lecture rooms, common rooms, and the refreshment room are all available for the use of students. Courses of study, including practical work, are provided for the degree of Bachelor of Dental Surgery of the University of London, and for the Diploma in Dental Surgery of the Royal College of Surgeons of England. Special arrangements are made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in Dental Surgery. Full particulars of the Dental School may be obtained on application to the Dean, Dr. H. Willoughby Lyle, or to the Secretary, Mr. S. C. Ranner, M.A., King's College Hospital, Denmark Hill, London, S.E. 5.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Metallurgy and Prosthesis. A systematic course of instruction is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 100 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4s. 6d., or including Mechanical Pupilage, £255 15s. 9d., inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the

University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15s.; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5s., payable in two instalments of £13 2s. 6d. each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupillage, £111 11s. 3d., which may be paid in two annual instalments of £65 12s. 6d. and £45 18s. 9d. respectively; mechanical pupils may join for a probationary period of one month, fee £6 11s. 3d., which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2s. 6d. A Dental Scholarship is offered annually of the value of £37 10s. It is awarded to the student who, entering for the Dental Degree of the University, shall pass the best examination in the subjects studied during his apprenticeship. Application for admission must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Sept. 1st.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. The School forms a part of the Leeds School of Medicine, whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital at the General Infirmary. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery and prosthetic dentistry, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia and Dental Radiography. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, The University, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anaesthetics by specially appointed Clinical Teachers.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5s., paid in instalments. For the two years' Operative Course only, £26 5s., paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. In accordance with the new regulations, L.D.S. students who have taken two years' training in practical Dental Mechanics with a registered practitioner are required to take a further year in the Hospital mechanical laboratory, the fee for this being £63. All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anaesthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £60 4s. if paid in one sum, or £62 6s. if paid in two instalments of £31 3s. The Composition Fee for the Lectures at the Colleges of Medicine and Science is £67 10s.; in addition to this there is a library and an athletic club fee. The fee for General Hospital Practice at the Royal Victoria Infirmary, Newcastle-upon-Tyne, is £23 2s. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Colman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. A large and important extension of the existing buildings is now in process of construction. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £118 16s. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence in Dental Surgery amounts to £197 3s. 6d. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology,

Radiology, Anaesthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extra-mural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £60 on entry, or in two instalments of £35 and £30. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Fee for two years' tuition, £63, or in two instalments. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anaesthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anaesthetics. Fees: Hospital Practice (each year), £18 18s.; Lectures, £5 5s. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs.: E. S. Mellor to Kellett; H. L. P. Peregrine, A. Craig, C. N. Ratcliffe, J. F. Haynes, K. A. I. Mackenzie, G. Aubrey, R. E. Rampling, and H. L. Douglas to President, addl., for five months' course of instruction.

Surg. Lt.-Comdr. L. F. Strugnell, R.N., has been awarded Sir Gilbert Blane's Gold Medal, he having obtained a first-class certificate at the examinations held in 1925 for promotion to the rank of Surgeon Commander.

ROYAL AUSTRALIAN NAVY.

Surg. Comdr. W. J. Carr to President, addl., for five months' course of instruction.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. D. Bertram to Ajax for 28 days' training. D. R. W. Burbury entered as Proby. Surg. Sub-Lt., and attached to the London Division.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. R. C. H. Francis relinquishes his commn. and retains the rank of Capt.

The undermentioned Lts. (on prob.) are confirmed in their rank: R. A. Bennett, W. H. Carter, W. D. Speedy, W. A. D. Drummond, J. G. E. Vachell, J. N. Atkinson, J. D. Corner, and J. T. Smyth.

ROYAL AIR FORCE.

Flight Lt. T. P. Harpur resigns his temp. commn.

COLONIAL MEDICAL SERVICE.

Dr. J. A. Beamish, medical officer, West African Medical Service, serving in the Gold Coast, has been appointed to be a Senior Medical Officer in Nigeria, with effect from Feb. 13th, 1925, in succession to Dr. T. M. R. Leonard, D.S.O., promoted to be Assistant Director of Medical Services in that colony.

Special Articles.

INTERNATIONAL CONGRESS OF CHILD WELFARE.

THE first International Congress on Child Welfare, as noted in THE LANCET last week (p. 509), was held at Geneva from August 24th to 31st. It was presided over by Mr. André Oltramare of Geneva, and was well attended; over 800 delegates from all parts were present, including some 200 British representatives. The inaugural meeting was opened by Mr. Haeberlin, Vice-President of the Swiss Federal Council. The speakers included Prof. C. Pirquet (Vienna), the President of the Hygiene and Medicine Section, Mr. Georges Scelle (professor of international law at Dijon), President of the Social Welfare and Administration Section, and representatives of 12 other countries. The Marchioness of Aberdeen and Temair, speaking as President of the Education and Propaganda Section, referred to the work done by the International Council of Women (of which she was the President) in drawing up the declaration of the rights of the child, now called the Declaration of Geneva. Dr. Luis Morquio, the provisional director of the American International Bureau for the Protection of Childhood at Monte Video, in the course of his address, mentioned that at the Congress at Santiago (Chili) in 1924 all the delegates signed the declaration.

The Exhibition.

In the afternoon the exhibition was visited officially by Mr. Haeberlin. The comprehensive exhibit of Great Britain with over 2000 items included several excellent health posters. The Swiss exhibit was particularly good; Pro Juventute, an organisation centring in Zurich, which possesses three travelling exhibitions, showed an excellent display, which included articles used in the Froebel and Montessori methods of teaching. This society organises work for children's leisure hours. The Union Internationale de Secours aux Enfants, located at Geneva, set out the help given by 35 countries to the children of 38 other countries. The most striking feature of the French exhibit illustrated the work carried out by Mme. J. René Dubost in placing babies in families in Mainville and Milly, where they are visited regularly by English nurses and taken weekly to the local infant welfare centre also established by Mme. Dubost. Later the children are boarded out by the Assistance Publique in peasant families on farms. The most prominent Austrian exhibits illustrated the activities of the municipality of Vienna and the work of the Art School of Prof. Cizek, also of Vienna. The German exhibit, which was extremely well arranged, illustrated the work of the German Red Cross and the national equivalent of our "Save the Children Fund."

Sectional Meetings.

On Tuesday morning the sections met. The Medical Section dealt with the measures used in different countries to reduce infantile mortality before and after birth, tracing the problem back as far as the advocacy of the marriage of healthy parents. Dr. Rott (Berlin) spoke on prematurity; Prof. Pinard (Paris) referred to the evils of separating a child from its mother.

Infant Mortality.

Dr. A. K. Chalmers (Glasgow) held that we ought to consider whether the special decline of the infantile mortality-rate in our country was due to our efforts, or whether it were a biological phenomenon. He said that a decline had been recorded in all the countries of Western Europe, even in those where very little preventive work had been done, and that the mortality was increasing in some countries, such as Egypt, in spite of administrative efforts. The fall in

the rate in the British Isles had occurred in the children of a generation which had profited by the important addition of foreign meat to their food-supply. He thought we had not done enough to interest and educate fathers. The need at present was to get mothers to appreciate the value of the medical supervision of children between 1 and 5 years of age. He had found the mothers in Glasgow unwilling to avail themselves of antenatal care until one mother profited; she became an ardent apostle, and after that there was no difficulty in filling the clinics. Mme. Vivier-Robert (Strasbourg) indicated the importance attached in Alsace-Lorraine to the work of the health visitor. The members of the audience were very much impressed by the close correlation of the fall in infantile mortality, with the dates of the introduction of various specific preventive measures. Dr. Bornstein (Berlin) and Dr. A. Koller (Lausanne) spoke on alcohol in this connexion; both considered alcoholic habits and the alcoholised constitution of parents responsible for a considerable part of infantile mortality.

Prof. Winifred Cullis (London) referred to the striking reduction in infantile mortality from syphilis brought about by the treatment of pregnant women in Scotland and London.

The Feeding of Children.

In the discussion on the feeding of children of all ages Dr. R. C. Jewesbury (St. Thomas's Hospital) expressed his belief that no artificial preparation could take the place of breast-milk. He referred to the possibility of re-establishing lactation after it had ceased for six to seven weeks, also to the absence of any organisation in England for supplying wet nurses. He would like a uniform system of feeding adopted in England. Prof. Tailens (Lausanne) also held that every effort to lessen infantile mortality must take breast-feeding as its fundamental principle. A valuable paper on the feeding of the pre-school child was read by Prof. Bernheim-Karrer (Zurich); he thought that digestive disturbances due to faulty feeding were increasing; he had found that over-feeding with milk caused constipation, and even anaemia if too little fruit and vegetables were given. Dr. E. Nobel (Vienna) thought that for the school child breakfast should be one of the principal meals and equal in nutritive value to the midday and evening meals; during the morning and afternoon there should be two light meals.

Prof. R. G. Freeman (New York) described clean milking on a farm which supplied New York and showed slides, one of which demonstrated how a cow was prevented from lying down between grooming and milking. He said that bovine tuberculosis was being rapidly eliminated in the United States. Prof. Caronia (Rome), in an interpolated paper, dealt with his recent work on the prophylaxis of measles and scarlet fever; the part of the paper that dealt with measles was discussed by Dr. E. Nobel.

Heliotherapy.

On Thursday morning during the discussion on heliotherapy, Dr. Knut Wejdling (Stockholm) emphasised the importance of giving cod-liver oil with the light treatment. Dr. A. Rollier (Leysin) showed a series of slides demonstrating the results of the work carried out at Leysin. Dr. P. F. Armand-Delille (Paris), in an interpolated paper on tuberculosis, written in collaboration with Dr. Lestoquoy, described the work of the Œuvre Grancher, which places the healthy children of tuberculous parents in families living in the country. Drs. Messerly (Lausanne), Chatin (Lyon), Mme. Vivier-Robert (Commissariat-General de la République, Strasbourg) described the work done in their areas. The paper of Dr. O. Bernhard (St. Moritz), the originator of the use of sunlight in surgery, should be read in full. Dr. C. W. Saleeby (London), in a model address, referred to the glass made in Birmingham for windows which contains no lead and no large atoms to prevent the passage of the ultra-violet rays.

Orthopædics.

The chief addresses on the prevention of crippling in children were given by Prof. Hans Spitzzy (Vienna), Mr. R. C. Elmslie (St. Bartholomew's Hospital), and Dr. Murk Jansen (Leiden). Prof. Spitzzy showed slides illustrating what to do and what not to do to prevent deformities of growth during the critical period of life until the baby has acquired the upright position. On the walls of the room were displayed some extraordinarily good original pictures in colours by Udo Weith, with suitable text, dealing with the prevention of crippling. Mr. Elmslie, whose contribution also evoked great applause, thought that medical inspection in London schools was responsible for the large reduction in the number of cases of scoliosis. He asked the representatives of other nations to publish an account of the organisation of the work for cripples in their countries, and mentioned that many of the British orthopædic surgeons who had worked under Sir Robert Jones during the war had become personal friends and were thus able to meet and discuss their various difficulties and new methods.

Dr. Murk Jansen was much concerned at the evil effects on the offspring of excessive smoking by the expectant father and mother. He considered that the tobacco habit had a marked effect on growing cells. Some of the most valuable of the papers of the congress dealt with the unification of the prenatal, neonatal, and later infantile mortality statistics of different countries. Dr. Rott (Berlin) explained the importance of the work of the subcommittee of the League of Nations, which had formulated a definition of stillbirth for international use; Dr. L. I. Dublin, the statistician of the Metropolitan Life Assurance Company, New York, pointed out that in the States 4 per cent. of the total births are stillbirths, and that their number is practically the same as the number of deaths which take place during the second to twelfth months of life. Yet very little statistical work was or could be done by any country at present. Dr. Marcel Ney (Berne) also read a valuable paper on this subject.

In the other sections the chief papers of medical interest were read by Dr. Th. Simon (France) and Mr. Cyril Burt (London) on the standardisation of the definition of mental deficiency and its different degrees, and by Dr. D. C. Kirkhope (Tottenham) on the education of public opinion in child welfare.

At the concluding meeting of the Congress a number of resolutions were passed summing up the recommendations made during the meetings of the sections.

Excursions.

A pleasant feature of the Congress were the informal receptions held by Prof. and Frau Pirquet. After a trip on the lake the Medical Section were charmingly entertained by the Genevese Medical Society and the other sections by Mme. Gustave Hentsch and Mr. Edmond Chenevière. During the Congress visits were paid to local institutions in Geneva, including le Rayon de Soleil at Frontenex, an adapted football stand and pavilion; one of the three open-air schools; a *pouponnière* at Orange Canal; a home for unmarried mothers (La Retraite); the J. J. Rousseau Institute for research work in child study and experimental pedagogy; and the Cantonal Hospital with its maternity and isolation blocks. Unofficial visits were paid to see Mr. Spahlinger and his work, to Dr. Rollier at Leysin under the guidance of Dr. King Brown, and to the Institut d'Hygiène, where Mr. Maurice Valerien briefly indicated the chief sanitary features of the city and of the Canton of Geneva, and to Nestlé's milk factory at Vevey.

On Saturday the Congress visited Leysin, the village which has grown up round Dr. Rollier's first clinic, a modest chalet since expanded into 32 establishments capable of dealing with 1000 adults and 300 children at a time. Although many know the work from the film shown in England, nothing but a visit to the

village can enable anyone to envisage the place as a whole in the beauty and charm of its setting. It is evident that although the pioneer work carried out at Leysin by Dr. Rollier and his large staff has been and still is of great value, the organisation of the work of a similar kind in England to-day is equally good; the arrangements for the education of the child of school age while under treatment have, perhaps, been somewhat better organised owing largely to the work of the Board of Education; the after-care work in our country is also better. Possibly we have something still to provide in the way of arrangements for manual work for adults.

A visit was subsequently paid to Zurich under the guidance of Dr. Pfeiffer of the Pro Juventute Foundation. An unpretentious but well-run epileptic institution was inspected, under the charge of Dr. A. Ulrich, who considered sedobrol and a salt-free diet of great value. At the Orthopædic Hospital, Anstalt Balgrist, an address was given by Dr. Richard Scherb, and the good following-up system was described. At the Cantonal Institution for Blind and Deaf and Dumb Children the two types were kept entirely apart. Oral teaching only was carried on for the deaf and dumb; if a child could not be taught by this method it was not retained in the institution. The bedrooms for the children were good enough for a first-class hotel.

In the afternoon a pleasant home for unmarried mothers was visited with 16 beds and 30 cots; the mothers were confined here and allowed to remain in for another six weeks, the babies might be left in for two years or even more; later to the Children's Hospital and Polyclinic, of which Prof. E. Feer is the director. Here the most interesting feature were the glass cubicles in the observation block used for definite and suspected cases of infectious diseases. The visitors were informed that congenital syphilis had been so rooted out of Zurich that it was difficult to find clinical material for the students.

The conference as a whole was remarkably successful; it not only brought together fellow workers from many countries, but also provided matter for subsequent study by the technical experts.

THE "MEDICAL CENTRE" OF NEW YORK.

THE erection of the Columbia Presbyterian Medical Centre has now commenced and it is hoped to make of New York one of the world's greatest centres of medical teaching and research. The site occupies an area of 20 acres overlooking the Hudson River. The first building will be the new home of the Presbyterian Hospital and of the College of Physicians and Surgeons of Columbia University. This building will contain some 23,000,000 cubic feet, or one and a half times the space in the Woolworth Building in New York, the tallest building in the world at present. It is hoped ultimately to group together many medical institutions, covering many fields of treatment, education, and research which, though independent, will nevertheless coördinate the service of the sick and further the cause of health. Provision will be made for 1400 beds. The institutions already included in the plan, in addition to the two mentioned above, are the State Psychiatric Institute and Hospital, the Neurological Institute, the Babies Hospital, the Sloane Hospital for Women, the Vanderbilt Clinic, and the Presbyterian Hospital School for Nursing. All these are established institutions carrying on their work in old buildings in other parts of New York, and it is expected that their removal to new and larger premises at the medical centre will be effected with little or no interruption to their routine. Other institutions which it is hoped to include in the centre are ear, eye, nose, throat, and skin hospitals, a dental school, training schools for public health and social workers, a convalescent home,

as well as dormitories for students and housing for the staff and personnel.

The Presbyterian Hospital Building will have 17 stories; the first floor and mezzanine will be for administrative uses and the next 13 will be ward floors. Above them will come an operating floor and mezzanine, while on the top floor will be an open-air gymnasium, loggias, and a recreation roof. Each ward floor will be as nearly as possible a hospital in itself, with 64 beds, divided into single and small wards. Attached to them will be a laboratory, treatment rooms, service rooms, three solaria, and a reception and lecture room on each floor. Each floor will

the Squier Urological Clinic and will represent a self-contained unit devoted to bladder and kidney surgery, equipped with the most modern methods of diagnosis, with accommodation for 64 patients. Special floors will be allotted to the Sloane Maternity Hospital, which will have an obstetrical ward capacity of about 125 beds; while the Neurological Institute will need space for 200 beds, the number allocated to the State Psychiatric Institute and Hospital, now located on Ward's Island. There is distinct need for a recovery home which, it is hoped, will be erected on Riverside Drive, where the patient will have the advantage of being easily accessible to those



The Columbia Presbyterian Medical Centre as it will appear when completed. The new Presbyterian Hospital, now under construction, is the nearer half of the large central unit.

have its own permanent nursing staff. In this way the patient will have all the advantages attaching to a small institution while at the same time commanding the resources of the centre as a whole. The private patients' pavilion will have 125 rooms, and there will be accommodation for relatives and friends who wish to live near the patients for a short period.

The medical school of Columbia University will have a building of the same height as the hospital building and connected with it on all the floors by an axis in which will be offices for the doctors and rooms for equipment to be used by both the school and the hospital. Included in the plan is an operating amphitheatre to serve the group and afford a clinical meeting-place for medical congresses. A unit corresponding to the medical section is reserved for the future development of the Vanderbilt Clinic, while the site for the Babies Hospital will be large enough to accommodate some 160 beds, thus enabling it to extend its work to include older children as well as infants. The Presbyterian Hospital of Nursing will have a building for 400 nurses. The eighth floor of the General Hospital Building will be devoted to

under whose observation he should remain while recuperating.

Special attention will be devoted to the housing of the students and personnel. The keynote of the medical centre will be coöperation. It will be not so much a single organisation as a community in which everyone is concerned with the same general problem of restoring the patients to health and keeping them well afterwards. Each institution will retain its independence and will have its own trustees or managers, but they will all work together through the joint administrative board, composed of representative physicians and laymen.

While the cost of the buildings now in progress is estimated at \$10,000,000, the final cost of the centre can only be vaguely guessed at at present. It certainly will run into many millions sterling. In the same way, it is difficult to estimate the time it will take to evolve the project to its fullest possibilities. The present belief is that it will need a generation, but maybe some public-spirited millionaires will come forward and provide the funds to carry the scheme to completion in ten or a dozen years from now.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Restriction of Hospital Beds Under Government Control.

FOLLOWING the stringent measures of economy, to which our budget is forced by the control of the League of Nations, a number of Viennese hospitals are to be closed down because the beds in these institutions are not in full-time occupation. Owing to the new hospitals erected on the outskirts of the city within the last 15 years, and to the numerous well-equipped new hospitals in the smaller provincial towns, the sick and the ailing do not flock to Vienna as they used to do. The diminution of the number of inhabitants of our country—now 6½ millions against 56 millions formerly—has also had its effect. The Government has found it more feasible to distribute the patients all over the country, thus keeping the minor hospitals in the provinces fairly busy. Not only has this scheme advantages from the point of view of economy, most of these hospitals being maintained by the local authorities, but it also promotes the general professional standing of the country doctors. Three hospitals have thus already been closed in Vienna, and the fourth—the Poliklinik, well known to every student of medicine in Vienna—has only escaped this fate through reorganisation; it is now rapidly becoming a hospital for the middle-class citizen with limited means. Its out-patient department, however, is working as usual. In order to understand the situation it must be added that in this country until 30 years ago all hospitals were Government institutes, with the exception of a couple or so of private hospitals, and one municipal hospital in Vienna. The system of hospital support by voluntary contributions is not known here. Local hospitals, indeed, were erected not very long ago in smaller towns by the municipalities and in Vienna by private corporations, but they soon had to fall back on Government support, especially in the years 1914–24. Now conditions have changed. What we really do want is not so much an increase of general hospital beds, but tuberculosis beds. Even here, however, our expenditure is curtailed by the urgent order of the "League" for economy.

Is the Human Saliva Poisonous?

An incident occurred recently in a public bath which has caused comment in medical circles. The facts are as follows: A girl of 15 was playfully bitten by a young man on the thigh whilst the two were enjoying themselves in one of our public sunbaths. The girl applied for medical help, stating that the bite had been caused by a dog, and was promptly sent to the hydrophobia department of the institution for experimental pathology. There she underwent a course of anti-rabic injections. She soon developed marked weakness, hypersensibility of the skin, pyrexia, and gradually symptoms of paralysis of several limbs appeared. After about a dozen injections the girl died. Rumours soon spread that she died in consequence of the injections, especially when her girl friends volunteered the information that the bite was inflicted not by a dog but by a young man. Police investigations were at once instituted and a post-mortem was obtained, in which it became clear that the girl had died from acute poliomyelitis, the fatal illness having no connexion either with the bite or the injections. But in the course of the public discussion, Dr. Kraus published an essay in which he set forth present knowledge regarding the toxicity of the human saliva. Many authors in the past, including Galen and Pliny the Younger, have pointed out that this fluid has a special activity. In comparatively modern times, about 90 years ago, Eberle reported from personal experiment that saliva had toxic effects, this quality depending on emotional conditions. A series of investigations were conducted by Pasteur in his laboratory, showing that over 32

different strains of pathological micro-organisms have been isolated from human saliva, some with distinct virulent effects, besides about 20 strains of non-virulent type. Dentists know very well that the mouth is a focus of infection. The assumption that the girl died from the human bite could not therefore be repudiated off-hand. But investigation proved that by a coincidence death had occurred from an infectious disease and was quite unconnected with the playful assault.

Two Distinguished Medical Contemporaries.

One of the most eminent of the Vienna medical teachers, Prof. N. Ortner, director of the second medical clinic in our city, recently celebrated his sixtieth birthday. A native of the city of Linz, he studied in Vienna in the clinics of Bamberger and Neusser. As assistant to the latter he found excellent opportunities for the study of numerous pathological conditions. His chief attention centred at that time in the conditions of the liver and gall-bladder, and his books on "Cholelithiasis" and "Infection of the Bile-ducts" won for him the gold medal of the Vienna University. Between 1895 and 1899 he published a series of papers on diseases of the vagus, paralysis of the recurrences, and on adventitious murmurs in peritonitis and pseudo-pericarditis, which showed a brilliant gift of keen observation. He thereafter published a series of lectures on special therapy of internal diseases, a concise and easily intelligible contribution to modern medicine. He was called to Innsbruck as clinical teacher (1907–11), but in 1911 he was recalled to Vienna and since that time has acted as a prominent member of the teaching staff of the university. Ortner is held in high esteem by his colleagues, as the recent "festschrift," published by the *Wiener medicinische Wochenschrift* showed. Another birthday jubilee has also been celebrated recently. The well-known ophthalmologist, Dr. S. Klein, completed his eightieth year in full health. He was one of the first pupils of Täger, and is the only man here who still examines the fundus with Täger's ophthalmoscope, a method of excellent value, but hardly known to the younger generation. Klein's merits are on the diagnostic and therapeutic side of his science, and his skill as an operator is still a joy to those privileged to watch him.

SOUTH AFRICA.

(FROM OUR OWN CORRESPONDENT.)

Medical Congress at Maritzburg.

THE twentieth South African Medical Congress was opened in the Town Hall, Maritzburg, Natal, on July 6th, by Sir John Dove-Wilson, the Natal Judge President and President of the Council of Natal University College. There were 120 delegates present from all parts of the Union of South Africa and Rhodesia. Sir F. Spencer Lister, representing the South African Committee of the British Medical Association, inducted Dr. Dugald Campbell Watt, J.P., one of the oldest practitioners in Maritzburg, to the chair as President of the South African Medical Congress. Sir John Dove-Wilson, in his address, said his endeavour was to emphasise the extent to which the two professions of medicine and law are associated in a common task, and to acknowledge the great debt which the law owes to medicine for its loyal assistance and coöperation in the great work of doing justice between man and man. He dealt with the difficult problem of professional secrecy, and remarked that patients had no right to expect, or doctors to demand, that knowledge gained in their professional capacity should not be divulged by doctors in a court of law when it was relative to the matters at issue.

The President said that it was 20 years since a medical congress had been held in Maritzburg, and

many changes had taken place. He recalled his predecessor in the chair in that city 20 years ago, Colonel James Hyslop, D.S.O., V.D., M.D., a man honoured in his day and generation. As against the sad and inevitable losses that the efflux of time had caused, they had seen in those passing years the advent of many young, energetic, and well-qualified colleagues, both eager and able to carry on the ideals and duties of their profession.

The President's address dealt mainly with the necessity for a spirit of unity, and outlined the history of medical associations in general and the S.A.M.A. in particular. He said that the science and art of medicine in all its branches had become so intricate, extensive, and profound that no one human brain, however brilliant, could hope to reach the highest standard of efficiency in all. The practitioner was, therefore, compelled to collaborate with others who had; after qualifying, made one subject or another their special study. Strength was much required for the vigorous prosecution of their work in all its branches—from research to clinical—and this could only be effectively utilised and developed by uniting the whole of the necessary forces in the State, both lay and professional. All had one object in view: the greater alleviation of suffering, the abolition of the causes of disease, and the propagation of a sane, healthy, and virile population. It was the duty of the State to afford them its moral and financial support.

On the first evening of the Congress a public lecture was given in the Town Hall, Maritzburg, by Dr. Shadick Higgins, M.O.H., Cape Town, recently medical officer of health for St. Pancras. His subject was Public Health in Relation to Social Welfare. Ten papers were read at the Section of Medicine and Mental Hygiene, under the presidency of Dr. E. P. Baumann. The meeting opened with a paper by Dr. R. L. Girdwood on Focal Infection. The Surgical Section met under the presidency of Dr. A. McKenzie to discuss the Treatment of Carcinoma of the Breast, the subject being introduced by Mr. H. A. Moffat. The Public Health Section discussed the milk-supply and had two subsections for M.O.H.'s and school M.O.'s respectively. The causation and prevention of foetal death was discussed at the Obstetrical Section under the presidency of Dr. A. Simpson Wells, and a special discussion on the work of the laboratory in relation to the practice of medicine was opened by Sir F. Spencer Lister.

Obituaries.

The late Dr. J. A. Clements had filled the post of Government district surgeon for the Umsinga district of Natal, and was an extremely popular and honoured officer. His death followed an operation for internal ulcer.—The late Dr. Wynn Westcott had become a resident of South Africa after his retirement from the coronership in London. He had attained much distinction in Blue Masonry and had been a Master of Lodge Quatuor Coronati, the membership of which is restricted to Masons noted for original research and literary work. He was also a student of the Kabalistic philosophy, Hermetic writings, and the work of the alchemists and Rosicrucians, of which latter he held the office of Supreme Magus.

A Central Leprosy Hospital.

The Union Leprosy Commission concluded its deliberations at Cape Town on June 24th, and will not meet again this year. According to *Die Burger*, the Commission recommends doing away with all the several smaller isolation places and having one central leprosy hospital in Pretoria, as being the most suitable position. The idea is to make this hospital a modern model institution, and the Commission, it is stated, has worked out a scheme which will save the Union Department of Public Health about £20,000 a year. Some members of the Commission were in favour of having a medical expert specially brought to South Africa in order to advise the Government on the building and fitting out of the proposed hospital.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Irish Free State and the Medical Register.

THE controversy on the question of medical registration in the Irish Free State is still carried on in the Irish press, but it has shown a milder tendency in the past ten days. This change of atmosphere is due in large measure to the conciliatory attitude taken by Mr. Cosgrave, the President of the Irish Free State. In reply to a memorandum sent to him by the President and Fellows of the Royal College of Physicians, he invited the College to send a deputation to discuss the matter with him. The deputation met him on Sept. 3rd, and a frank discussion was held on the present situation. Mr. Cosgrave was firm on the point that the Government was determined to establish a medical register for the Irish Free State, and, if forced, was prepared to go to the country and fight the matter at the meetings. The Government had not yet framed a Bill, and he invited the coöperation of the profession in its drafting. As soon as the Bill was framed it was the intention of the Government to approach the English Government with the view of obtaining some sort of reciprocity between the two countries; and he believed that he would obtain such a measure of reciprocity as would not endanger the status of persons seeking Irish medical qualifications. The deputation urged that, if the Government were determined to set up a medical council and register in the Free State, the existing conditions should be allowed to continue until such time as that had been accomplished. Mr. Cosgrave, while remaining sympathetic towards this view, pointed out that any such continuation of the existing conditions would be granted only on the condition that prolongation was not used for the purpose of delaying the establishment of an Irish register.

Mr. Cosgrave has invited the members of the Consultative Committee, consisting of representatives of the educational bodies and of the medical profession, to meet him in conference on Sept. 9th. In the meantime, the meeting of protest, to be held on Sept. 8th, will have contented itself with a recognition of Mr. Cosgrave's conciliatory attitude.

Sept. 7th.

INDIA.

(FROM OUR OWN CORRESPONDENT.)

A General Medical Council for India.

It is interesting to learn that a private member proposes to introduce, in the coming session of the Indian Legislative Assembly, a Bill for the formation of a Council of Medical Education in India. The idea is to create a body on the lines of the General Medical Council of the United Kingdom for controlling medical education under the direction of the medical profession. As one of the objects of the measure will be to establish a qualification in the indigenous methods of treatment of disease, it is not surprising that disapproval has been warmly expressed at a meeting of medical men held in Bombay.

The Committee appointed by the United Provinces Government to advise them regarding the best means to be adopted for improving the Ayurvedic and Unani systems has commenced its labours, but it will be some time before it presents its report.

The Supply of Medical Students.

At the Medical College, Calcutta, 120 vacancies were announced for the last winter session, and there were 1000 applications. The Government of Bengal control the college, and were therefore able to issue specific orders as to the qualifications of applicants. The most noteworthy of these were: (1) that a few places were reserved for men who had taken the B.Sc. degree; (2) that half were reserved for candidates who had passed high up in the intermediate science

examination; (3) that four places were reserved for the sons of distinguished medical men; and (4) that only five places were reserved for women students.

Broadcasting Epidemiological Information.

It was decided at a conference attended by delegates from 12 Far Eastern administrations that the first appearance in any part of Asia or Australia of cholera, plague, small-pox, yellow fever, or the unusual prevalence of any other infectious disease, should be immediately reported to the Far Eastern Epidemiological Bureau, and that a weekly bulletin should be despatched recording: (1) The mortality from these diseases; (2) the existence of plague infection among rats; and (3) notes of unusual epidemics. The information collected by telegraph from the various Governments is broadcasted by the Government of French Indo-China from their wireless station at Saigon, and in India this information is received at Simla by the Public Health Commissioner with the Government, and then distributed to the health officers of the large Indian ports, who have thus, each Saturday morning, detailed information regarding the health of the major ports of the Far East up to the midnight of the previous Saturday.

Extended Distribution of Anti-Rabic Vaccine.

The Pasteur Institute at Kasauli is now issuing vaccines on a large scale to various centres for anti-rabic treatment. Prior to Jan. 1st of the present year, the only regular issue of vaccine was to a railway centre at Allahabad, but recently a centre was opened by the Punjab Government at Lahore, one at Rawalpindi for soldiers, and another at Rajkote, in Kathiawar, and these are likely to be followed by others in various parts of India. The Behar and Orissa Governments have decided, moreover, to open a centre and make their own vaccine. These developments enable patients to be treated in their own districts.

Child Welfare Work in Madras.

The Government in reviewing the report on child welfare work for the quarter ending March 31st, 1925, state that only three district boards, 23 taluk boards, and 34 municipalities have sent in reports of their work. There are only 45 centres in the Presidency for a population of over 43 millions. The districts of Cuddapah, Kurnool, Guntur, Nellore, and Malabar do not possess a single child welfare centre. On the other hand, there are eight centres working in the Chittoor district, and among the remaining districts, three—the Nilgiris, Vizagapatam, and Chingleput—have four centres each, two others have three centres each, six have two each, while the rest have one centre each. The municipalities of Chingleput, Madura, Vellore, Tanjore, and Ootacamund have each of them two centres, the two at Chingleput having been organised and maintained by the Red Cross Society. Only seven new centres were opened in the Presidency in the year under review, in spite of the Government's special appeal in the last year's review. Thirteen local bodies have organised committees for intensive child welfare propaganda and the inauguration of new centres wherever feasible. To facilitate the opening of more child welfare centres and their efficient working the Government have decided, as an experimental measure, to train four women as health visitors with a view to their subsequent employment by local bodies.

A successful "Baby Week" was recently organised in Poona.

Training and Employment of Qualified Midwives.

Only 17 municipalities and eight taluk boards are so far known to have employed qualified midwives in their service. Of these, four were appointed during the year under review by the municipal councils of Villupuram and Cuddalore, and the taluk boards of Perambalur and Koilkuntla. The appeal made by the Director of Public Health to the local bodies to take steps for the training of midwives did not meet with sufficient response. The supervision of the work of

trained "dhais" and the improvement brought about by training do not seem to have been adequate.

Medical Inspection of School-children in Madras.

The system of inspection of pupils in recognised secondary schools sanctioned in 1920 is now to be put into force. The inspection will be confined for the present to recognised secondary schools for boys, school departments of colleges and training schools, and will be carried out annually by local practitioners selected by the local boards of management or the Director of Public Instruction in consultation with the Surgeon-General. The aim will be to ascertain the general physical condition of the pupil, the treatment of those suffering from disease being left to the parents. The management of the school undertakes to maintain the records and submit the required returns.

Meagre Hospital Facilities in Bombay.

The Government of Bombay has addressed the municipality on the subject of the inadequate hospital accommodation provided in Bombay, in comparison with its population and importance. The number of beds available for the treatment of general diseases is only 526, or approximately 1 bed for every 2000 of the population. On making a comparison with the other leading cities of India, it has been found that the number of beds per 1000 of the population is as follows: Lahore, 7.2; Madras, 3.4; Calcutta, 2.6; Bombay, 0.5. The Government call for a conference to discuss the subject of medical relief in the great city which has been aptly called "The Gateway of India."

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the health statistics of six counties for 1924:—

Name of county.	Mid-year population (R.G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.	
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.
Surrey . . .	742,900	14.9	10.6	0.80	1.45	2.0	—	52
Wiltshire . . .	295,100	17.1	11.4	0.83	—	—	—	55
Northamptonshire . . .	215,200	16.2	11.6	0.91	1.31	1.9	—	52
Warwickshire . . .	358,300	18.8	11.0	0.89	1.25	1.9	—	60
Leicestershire . . .	273,100	18.8	11.7	1.01	1.29	2.2	—	60
Fife (landward area)	108,161	24.0	12.2	0.83	1.06	2.4	—	84

Surrey.

Dr. Joseph Cates reports that the infant mortality and general death-rate are slightly higher than in 1923, and that influenza and its respiratory complications were among the causes of this increased death-rate. The county council now has a comprehensive and compact scheme for all branches of home visitation which has been evolved so as to obviate overlapping. The county is divided into 12 areas. In each area there is an assistant medical officer, who carries out school medical inspection and treatment, maternity and child welfare and dispensary duties. Three or four health visitors, who are fully trained nurses and hold the certificate of the C.M.B. and the health visitors' certificate of the Royal Sanitary Institute, are allocated to each area. These health visitors carry out antenatal and birth visita-

tion, follow up defects discovered in the scholars of the elementary and secondary schools, inquire into tuberculosis, supervise the mentally and physically defective, and visit the blind.

Surrey now has an organised scheme for the discovery and treatment of crippling defects. Children are referred to the assistant medical officers by the health visitors, teachers, school attendance officers, and voluntary workers, and after examination are sent to the orthopaedic centres included in the scheme. Children of school age, who reach the centres on the advice of medical practitioners and other agencies, are seen by the assistant medical officers before the committee accepts liability for treatment. The approved orthopaedic centres are the Guildford County Hospital, the Croydon General Hospital, the Nelson Hospital at Raynes Park, and the aid-posts of the Red Cross Society at Kingston and Woking. At each centre there is in attendance an orthopaedic specialist and nurses trained in massage, electrical treatment, and plaster work. Minor operations are carried out at the centres; major operations in one of the hospitals mentioned or a London hospital. For certain of the patients prolonged in-patient treatment is necessary, and 50 beds at the homes of the Waifs and Strays Society at Pyrford have been secured for the purpose. These homes are recognised by the Board of Education and are well equipped for the operative treatment and education of cripples. The county council pay 3s. per attendance at the centres for cases referred by their assistant medical officers and £101 a year for each occupied bed at Pyrford.

Dr. Cates refers to the complaints, which are made from time to time by the Surrey local sanitary authorities, as to the dumping of refuse by certain of the metropolitan borough councils, and is emphatic that the time has arrived when urban communities should destroy their refuse in a properly constructed destructor. During the present year a survey will be made of the methods adopted throughout the county for the disposal of refuse. A report on isolation hospital accommodation in the county indicates the need for some reorganisation. For example, the Frimley Urban District Council's hospital at Mytchett is quite unsuitable, and diphtheria cases from this district are already sent to the Farnham Hospital. Dr. Cates considers that the Frimley hospital should be closed and all cases of infectious disease sent to the Farnham or some other hospital. Again, at Redhill are the well-constructed hospital of Reigate borough and the antiquated, unsatisfactory hospital of Reigate district, whereas the former building would serve both areas. A third recommendation is that the Epsom Urban District Council should close their hospital and arrange for their patients to be admitted to the Joint Hospital at Cuddington. The report for 1922 contained a complete survey of the Hogsmill; that for 1923 a survey of the Wandle; and the present report contains a survey of the Beverley Brook. The condition of the Beverley Brook, says Dr. Cates, is not so serious as that of the River Wandle, but furnishes additional evidence that the county council needs supplementary powers to enable them to deal satisfactorily with the condition of the rivers in the county.

Wiltshire.

Dr. Claude E. Tangye reports an increase in the prevalence of encephalitis lethargica, there being 12 cases notified as against three in 1923. Four of the cases ended fatally and most of the survivors suffered damage to the nervous system. Five children of school age survived the disease with impaired mentality and a sixth with facial paralysis. Other cases of this disease have occurred which were not notified at the acute stage, but only diagnosed by the after-effects. The orthopaedic clinics which have been started at Devizes, Trowbridge, Corsham, and Swindon in connexion with the Children's Orthopaedic Hospital at Bath, have been of great value to the tuberculosis scheme. Dr. Tangye points out that the

notification of tuberculosis is still incomplete and that about one-fifth of the deaths from tuberculosis in 1924 were unnotified cases. An arrangement has been made with Swindon whereby midwives notify all cases of discharging eyes, however slight, to the borough medical officer of health. Under this scheme 13 notifications were received by Dr. D. Brewer, the Swindon M.O.H., and the cases were subsequently treated at the borough child welfare clinic with most satisfactory results. The health visitors of the county council supervise boarded-out children for most, but not all, of the boards of guardians in the county. In consequence of the relatively high rate of maternal mortality in the county, the district medical officers of health were asked to furnish details of all deaths from complications of childbirth in return for a small fee. A number of such reports have been received, but it is too early to judge of their value. There are now six maternity and child welfare centres in the county. The centre at Trowbridge is the only one administered directly by the county council, the others being under voluntary committees. Antenatal work has been begun at the Trowbridge centre, and the employment of practitioners of special experience in this work is a question which is receiving careful consideration.

The report on the sewage works of the county shows that there is considerable pollution of the rivers by a large number of unsatisfactory effluents. Only one licence has been issued by the county council under the Milk Designations Order—namely, for Grade A milk. The shortage of houses in Wiltshire is still acute and very little is being done in the matter of the inspection and repair of insanitary houses. Dr. Tangye reports that the provision, by which the local sanitary authority can carry out repairing work in the default of the owner and charge the owner with the cost, is practically never used. It is surprising to learn that there are four rural districts which have no building by-laws. Of these, says, Dr. Tangye, "the Bradford-on-Avon Rural District is conspicuous for the activity of building operations quite uncontrolled by the local sanitary authority."

Northamptonshire.

Dr. Charles E. Paget notes the passing of the Thames Conservancy Act, 1924, as one of the important events of the year. By this Act the jurisdiction of the Thames conservators has been extended to six additional counties—viz., Northamptonshire, Warwickshire, Worcestershire, East and West Sussex, and Bedfordshire. The effect of the Act is to bring all sources of sewage pollution of the River Cherwell and its tributaries within the rural districts of Brackley, Daventry, and Middleton Cheney under the surveillance of the conservators. When the Bill came before Parliament there were three serious pollutions of the Cherwell. In respect of two of these action had already been taken, but the Brackley R.D. Council had refused to carry out a scheme for Kings-Sutton on the grounds of expense. Dr. Paget points out that the standard of purity required by the Thames Conservancy is much higher than that adopted by any authority enforcing the Rivers Pollution Act. Presumably the Brackley R.D. Council will have to come into line. Dr. Paget reports an increase in the prevalence of encephalitis lethargica. There were 19 notifications in 1924, as compared with 6 in 1923; 9 of the cases ended fatally; 7 of the 9 deaths occurred at or over the age of 45.

The inspection of dairy cows in the county during the year was interfered with by outbreaks of foot-and-mouth disease. To Dr. Paget's regret, veterinary inspection is not in operation in all parts of the county. There are two joint committees in the county for veterinary inspection and the results judged by success in finding cows with tuberculous udders are a curious contrast. Thus the veterinary inspector of the Kettering Joint Committee found six cases of tuberculous udders among 3808 cows, while the

veterinary inspector of the Wellingborough Joint Committee found 16 tuberculous udders among 2076 cows. The county analyst, Mr. E. W. Voelker, reports that nearly 10 per cent. of the 371 milk samples were adulterated, 26 being deficient in fat and 10 being watered. The proportion of butter samples containing boric acid preservatives was much less than in 1923. One reads with interest that two samples sold as "ginger brandy" were non-alcoholic syrups flavoured with ginger, while a beverage with the innocent name of "cowslip wine" contained 29 per cent. proof spirit.

Warwickshire.

Dr. A. Hamilton Wood reports a considerable amount of progress in the matter of prevention of river pollution. The activities of the Upper Tame Basin Joint Committee have stimulated the authorities whose effluents were polluting the Tame before it reached Warwickshire. The Birmingham Tame and Rea District Drainage Board have introduced many improvements including bio-aeration plants, and a great improvement is expected in the quality of the effluent of 30,000,000 gallons per day discharged into the Tame below Water Orton. The condition of the River Cole is also improved. Important reconstructions have been carried out at the sewage works of both Hinckley and Nuneaton, which will improve the condition of the River Anker. The Avon is still polluted by sewage from the city of Coventry, but it is expected that an improvement will shortly result from the installation of the bio-aeration plant which is now in progress at the city sewage works. The effluents from the Warwick sewage farms and the Leamington sewage works are still unsatisfactory.

The county analyst, Mr. Rigby, reports that the average composition of the milk samples analysed during the year showed 8.75 per cent. of non-fatty solids and 3.88 per cent. of fat. For the first and fourth quarters of the year the average was about 8.74 per cent. of non-fatty solids and 4.02 of fat. For the two middle quarters of the year the non-fatty solids averaged about 8.76 and the fat 3.73. The fat was thus 0.3 per cent. higher during the winter quarters. The record of the V.D. clinics shows an increase in new cases dealt with from 179 in 1923 to 264 in 1924. The patients who ceased to attend without completing treatment numbered 116, while only 40 were discharged after the completion of treatment. Dr. Wood, referring to the statement of the Ministry that no Exchequer grants are available towards the cost of the training of midwives, points out that local expenditure either from voluntary or rate-aided sources must be increased if the efficiency of the county midwifery service is to be maintained.

In view of the high maternal mortality from child-birth provision has been made for complicated midwifery cases at several hospitals and at the county maternity homes at Warwick and Rugby. The Warwick home admitted six antenatal cases and the Rugby home 12 antenatal cases during the year. Only 144 new cases attended the antenatal clinics, while the number of births in the county was 6722. Both of the county homes have been recognised by the Ministry as training institutions for midwives. There were 34 notifications of ophthalmia neonatorum with no cases of impaired vision. This result is attributed to the routine use of a colloidal silver preparation by the midwives introduced in 1919 and perfected in 1920. The following are the cases of blindness in infants from ophthalmia neonatorum during the last nine years:—

Year.	Notifica- tions of ophthal- mia.	Blindness.		Year.	Notifica- tions of ophthal- mia.	Blindness.	
		Both eyes.	One eye.			Both eyes.	One eye.
1916	66	1	1	1921	36	0	0
1917	60	2	0	1922	59	0	0
1918	46	1	1	1923	40	0	0
1919	52	1	1	1924	34	0	0
1920	56	0	1				

Leicestershire.

Dr. T. Robinson reports an effort towards the production of cleaner milk in the county. The county laboratory is to be extended and its staff increased in order to deal with milk samples sent by the district councils. Both the district councils and the vendors will be informed of the result of the examination. A clean milk competition was held during the year, for which 20 farmers entered. For the competition six samples were sent by the competitor and one surprise sample was taken. A steady improvement was noticed in the samples as the competition progressed. Of the 20 competitors eight produced Grade A milk in each of the seven specimens, while only one competitor failed to produce Grade A milk in any of the seven samples examined. The Ministry have issued four licences for Certified milk and one for Grade A (tuberculin tested), while the county council have issued Grade A licences to three producers. Small-pox was introduced into the county in December, 1923. There were 98 cases reported during 1924. The disease was of a mild type and caused no deaths.

Fife.

Dr. G. Pratt Yule, in referring to the fact that the Board of Health has issued an Order making infective jaundice compulsorily notifiable, states that this disease appears to be associated with a similar condition in rats and that it has occurred among miners in the county in the past, but would appear to have been limited to pits in the Lochgelly-Cowdenbeath area. During 1924 seven lupus patients were sent to Edinburgh to receive treatment at Sir Norman Walker's arc-light clinic at the infirmary. Dr. Yule and Dr. McGillivray (the tuberculosis officer) were much impressed with the results obtained at this clinic. They saw one case, who had been attending the infirmary for 40 years trying all kinds of treatment without benefit, and whose lupus was practically healed after four months of the light treatment. They recommended that a similar clinic be established at the county sanatorium at Glen Lomond. Dr. W. P. S. Johnson, the medical officer of the Dunfermline V.D. centre, reports that, as compared with 1923, there is an increase in the percentage of gonorrhœa cases and a decrease of syphilis cases. The percentage of cases which cease to attend before the completion of treatment was 13.3, which compares very favourably with the experiences of other centres. Dr. Johnson points out that the clinic in Market-street is unfortunately situated; for one thing, it is at a distance from the hospital where the in-patient treatment is carried out, but the principal objection is that the position is so exposed that prospective patients are deterred from attending. Housing conditions are still difficult, and the need is particularly urgent in the mining districts of Kirkcaldy and Dunfermline. No applications have been made for licences to sell graded milk.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 29TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 37; scarlet fever, 1362; diphtheria, 787; enteric fever, 84; pneumonia, 449; puerperal fever, 41; cerebro-spinal fever, 6; acute poliomyelitis, 12; acute polio-encephalitis, 2; encephalitis lethargica, 34; continued fever, 1; dysentery, 8; ophthalmia neonatorum, 109. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there was 1 death from enteric fever, 20 from measles, 5 from scarlet fever, 40 from whooping-cough, 12 from influenza, and 27 from diphtheria. There were 218 deaths of children under 2 years from diarrhoea and enteritis, as compared with 177, 136, 108, 101, and 64 in the preceding weeks. In London itself there were 10 deaths from diphtheria, 5 from whooping-cough, and 1 from influenza.

Correspondence.

"Audi alteram partem."

THE INDIAN MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—I was delighted this morning to read the leading article in THE LANCET on the Indian Medical Service. It was most refreshing after the orgy of pessimistic representations that have appeared in other papers. The article is, I believe, an accurate statement of the present position of the I.M.S., and taken with what appeared in the Students' Number last week should be very helpful to young medical men wishing to know the exact state of things.

I was very glad also to read your eulogy of Lord Sydenham's speech. The fundamental point is that the I.M.S. is not to be abrogated. I am inclined to think that once the home schools' embargo is raised there will be a rapidly increasing number of candidates for the I.M.S. There will be few home candidates for the 50 per cent. appointments of the civil or rather provincial medical services: the Lee Commission recommended that the shortage of these 50 per cent. was to be made up by additional transfers (apart from the War Reserve of 122) from the R.A.M.C. (India). If this is given effect to in the I.M.S., we shall go near to a restoration of the status quo ante. *Nous verrons!*

I am, Sir, yours faithfully,

Westward Ho! Devon, Sept. 4th, 1925.

P. HEHIR.

* * If the recommendations of the Lee Commission are applied in their entirety to the Indian Medical Service it follows, as we set out in the Students' Number of THE LANCET, that no attempt will be made to perpetuate that Service as at present constituted. Happily, the Government of India and the Secretary of State for India are in agreement that the Indian Medical Service must be maintained. Lord Birkenhead has still to communicate his final decisions, but there is nothing in the existing situation to belie optimism.—ED. L.

ADENOIDS AMONG SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—In reference to the annotation upon this subject in your issue of August 22nd (p. 391), it may be of interest to your readers to be reminded of an investigation into the occurrence of adenoids in three of the London County Council elementary schools, the results of which I published 15 years ago.¹ The investigation dealt with 2315 children and was made during the winter of 1907-08. Without going into details, which can be seen in the reference given, the conclusions to be drawn were as follows:—

1. That on the average about 37 per cent. of the children in elementary schools have adenoids, and between 72 and 76 per cent. have enlarged tonsils as well.

2. That on the average 31.2 per cent. of adenoid cases are mouth-breathers, complete or partial, and that hypertrophy of the faucial tonsils may give rise to mouth-breathing in the absence of adenoids.

3. That sex appears to have no influence upon the incidence of adenoids.

4. That adenoids are most common about the age of 8 and are next most frequent at about 12.

5. That true aprosexia is often confused with apparent dullness due to defective hearing, and that true aprosexia occurs only in about 4.7 per cent. of adenoid cases, is more frequent in girls, and, when present, is associated with a marked degree of adenoids.

6. The so-called adenoid facies is uncommon, save in association with a marked degree of adenoids.

7. That the association of an abnormally high palate with adenoids is rather due to peculiarities of cranial formation than to extra-uterine influences of nasal stenosis, and that, if there is any relation between a high narrow palate and adenoids, it is possible that the palate shape is rather the cause of the adenoids than vice versa.

¹ British Journal of Children's Diseases, February and March, 1910.

8. That the presence of adenoids has more to do with the presence of carious teeth than have mouth-breathing and palate shape, and that this is probably due to the increased tendency to oral sepsis in adenoid children.

9. That irregularity of the upper incisors is less a result of adenoids than of palate shape.

10. That the percentage of ear complications in adenoid children is about 10.8, and that adenoids are probably by far the most important factor in the aetiology of ear affections in childhood.

There is no need to compare my conclusions with those of Dr. Newsholme, but I cannot agree with his estimate that 5 per cent. only of the school-children would be suffering from symptoms calling for operation, presuming, of course, that the children referred to are the 600 out of 18,000. I am much more in agreement with my friend Dr. Dan McKenzie, that the percentage requiring operation is 30.

There is one thing that must be said in conclusion, for it has come repeatedly before me in my work as an officer of the L.C.C., and my experience has been endorsed by other otologists to whom I have spoken on the subject. It is that a large percentage of adenoid operations are inefficiently performed. Not a month passes without my being told by mothers that a child's deafness has been made worse by, or dated from, an adenoid operation. It is not the special hospitals that this complaint involves, but the large general hospitals and general practitioners in poor neighbourhoods. Even when the operation has been efficiently performed it would appear that in many instances the child is expected to recover hearing by itself, and no trouble is taken to follow cases up and to ensure that proper aural after-treatment is obtained.

Finally, the more I see of the treatment of adenoids and tonsils, the more I am convinced that the operation should be regarded as one of the highest importance and not as one so trivial that "anyone" can perform it.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY, F.R.C.S.,
Consulting Aural Surgeon to the London
County Council, &c.

Wimpole-street, W., Sept. 4th, 1925.

RADIATION FOR CARCINOMA:

MR. BONNEY'S CHALLENGE.

To the Editor of THE LANCET.

SIR,—I perceive from your report of the proceedings of the Section of Gynaecology at the B.M.A. annual meeting that Mr. Victor Bonney has been at it again. The mere mention of the word "radiation" appears to make him see red. Speaking of cases of carcinoma of the uterus with carcinomatous glands, Mr. Bonney said (THE LANCET, Sept. 5th, p. 498):—

"He did not use radium beforehand as a routine, though he had operated on a good many cases in which it had been so used with the idea of making the growth removable. Those who said it could do this did not know the limits of operability. It did nothing of the sort, but on the contrary made the operation much more formidable on account of the intense fibrosis set up, which so welded the surrounding tissues to the growth that all planes of cleavage were lost."

If Mr. Bonney goes on at this rate (and he *does* go on, as his later remarks will show) his name will become a bogey with which to frighten young radiologists at their mother's knee! I am not specially concerned to take up the cudgels for radium as a pre-operative treatment, as I think it is less easily controlled than X rays, and may, unless very skilfully handled, cause actual tissue necrosis, with resultant extensive scarring. But Mr. Bonney does not confine his hostility to radium. He goes forth with bell, book, and candle, reciting a kind of Athanasian Creed which includes radium, X rays, and their advocates in one comprehensive damnation.

Now, if there is one thing firmly established in radiotherapy, it is that X rays in suitable doses have the power to cause the absorption of pathological fibrous tissue. Keloid melts away under their influence, and the tense bands of a Dupuytren's contraction become softened. The X ray, it is true,

does not distinguish between fibrous tissue which is the result of disease, and adhesions which have been deliberately provoked by the surgeon. In a case published some years ago an intensive dose of X rays was given to a patient in whom a ventro-fixation of the uterus had been successfully performed 12 months previously. Within a few weeks of the irradiation the adhesions to the abdominal wall gave way, and the original prolapse recurred. This case was quoted by a surgeon to illustrate the dangers of X ray therapy; in reality it was an excellent proof of the power of X rays to dissolve fibrous tissue. That this particular result was not the one aimed at does not in any way invalidate the demonstration. I am frequently called on by my surgical colleagues to attempt to render an inoperable case operable, and in many instances I am able to cause a fixed growth to become movable. This is a statement which it is quite obvious that no responsible medical man would make unless he were prepared, if necessary, to produce independent surgical testimony as to its truth.

To quote Mr. Bonney further (p. 499):—

"His experience of this treatment (deep X rays) both for primary and secondary growths was most disappointing... No one was more anxious than himself to find a better method of treating carcinoma of the cervix than operation, but there was no sense in the advocates of radiation carping at the results of surgery until they had produced a series of figures comparable with those he had just put before them... What was needed was the publication of a British series of not less than 100 cases treated by radiation, in all of which at least five years had elapsed between the date of cessation of all treatment and the date of publication."

The idea of the British radiologist carping at the results of surgery makes one smile. If he has erred in the past it is by excessive deference to surgical views. *Damnat quod non intelligit* is not a fault which can be laid at his door. But Mr. Bonney issues a direct challenge. It is, however, one that he must know he is quite safe in making. To carry out such a test it would be necessary to secure 100 cases of pelvic cancer not of the moribund type, which the British radiologist usually sees, but similar to an average 100 of the cases which are now operated on. At present the sequence of events is this: The practitioner sends the patient to a gynaecological surgeon, who invariably recommends operation when this is technically possible. The radiologist sees only (1) the inoperable cases, (2) recurrences, and (3) a few patients who refuse operation. It is only from these latter that statistics such as Mr. Bonney asks for could be compiled, and I doubt if there are many radiologists who see 20 such cases in a life-time of practice. Is Mr. Bonney—is any gynaecological surgeon—prepared in his hospital practice to set aside 50 per cent. of all operable cases for five years or more in order to put the matter to proof? I think not. But unless those who control the cases are prepared to follow some such plan it is idle to taunt the British radiologist with the failure to produce statistics.

I express no opinion as to what the probable result of such a test would be. Personally, I have always advocated combination in treatment. My object has been to show that Mr. Bonney has issued a challenge which, through no fault of the radiologist, cannot be accepted.—I am, Sir, yours faithfully,

Harley-street, W., Sept. 5th. F. HERNAMAN-JOHNSON.

LONDON MEDICAL GRADUATES AND CONVOCATION.

To the Editor of THE LANCET.

SIR,—May I point out to all M.B.'s of London the significance of the amendment of Statute 41, Clause (ii), which was ratified by the King in Council in May last, and is now in force, which entitles every M.B. to be registered as a member of Convocation (and, subject to the Representation of the Peoples Act, 1918, places him on the Parliamentary roll for the University vote) immediately he or she graduates, provided the age of 21 years has been attained. Hitherto every graduate was compelled to wait

three years from graduation, which produced the striking anomaly that, whereas graduates in other faculties (divinity, arts, law, music, science, in which graduation can be attained after a three years' course) might enter Convocation six years from matriculation, graduates in the medical faculty were compelled to wait eight and a half to nine years.

I pointed this out in the *Times* of Oct. 23rd last, and at the same time memorialised the faculty representatives and the present Member of Parliament for the University. They agreed that the existing anomaly called for removal, and accordingly a motion was framed, and put by Mr. Eason at the meeting of the Faculty of Medicine on Oct. 29th last, which called the attention of Convocation to this anomaly, and recommended the amendment of Statute 41, para. (ii) by the abolition of the probationary period of three years. This was carried unanimously, and was sent on to Convocation. Independently of this action Dr. James Mould, at the request of the Twentieth Century Society of London Graduates, placed a notice of motion on the agenda paper of the meeting of Convocation held on Jan. 16th, 1925. Convocation resolved in accordance with the terms of Dr. Mould's motion which was then forwarded to the Senate, and, as stated above, was finally approved by His Majesty in Council in May.

The link between the University and her graduates needs strengthening by every possible means, and now that our Alma Mater stretches out her hands in welcome, it behoves every M.B. to become a member of Convocation as soon as possible, and thus to take an active interest in the government of the University.

I am, Sir, yours faithfully,

CHARLES A. H. FRANKLIN, M.D. Laus.,
M.B., B.S. Lond.

Bickley, Kent, Sept. 7th, 1925.

SILICATE IN A HARROGATE WATER.

To the Editor of THE LANCET.

SIR,—Valuable therapeutic uses are attributed to silicate by Prof. F. Luithlen in the article annotated in your issue of August 22nd (p. 392). Luithlen there points out the importance of a proper balance between calcium and silicon in healthy tissue. A deficiency of silicate is said to result in decreased elasticity and certain senile conditions. Any natural medicinal source, therefore, containing silicate presents points of interest hitherto rather neglected, although Weber and Weber ("Climatotherapy and Balneotherapy," p. 341) refer to the therapeutic influences of this compound.

In the Harrogate John's Well we have a water which appears particularly suitable for the administration of silicate. Only in very rare cases does the silicate content of a natural water approach the calcium in amount, and a brief search discloses no instance in which the ratio Si/Ca is so high as in the John's Well. Results of analysis of John's water, expressed in terms of parts weight of ions per 100,000:

Specific gravity 15°/15° C.	1.00019	Calcium	1.83
Total solid matter	19.00	Iron	0.98
Sodium	1.04	Manganese	0.022
Potassium	0.20	Chloride	1.80
Ammonium	0.009	Silicate	3.54
Lithium	trace	Sulphate	0.86
Magnesium	0.87	Carbonate	14.2

The water is palatable and assimilable. It is hypotonic, having an osmotic pressure of about 130 mm. of mercury. Usually it is prescribed for its iron content, which is small, but as Bain and Edgecombe say of this spring ("Harrogate Waters, Baths, and Climate," p. 66): "There are certain patients so peculiarly susceptible to the influence of iron that, unless weak solutions easily assimilated are prescribed, the remedy has to be abandoned." The ration of silicate to calcium is 1.93.

I am, Sir, yours faithfully,

A. WOODMANSEY, M.Sc.,
Analyst, Royal Baths, Harrogate.

Sept. 4th, 1925.

MISQUOTATION.

To the Editor of THE LANCET.

SIR,—In the *Vaccination Inquirer*, the organ of the National Anti-Vaccination League, dated Sept. 1st, a statement has been made to the effect that at a meeting of the Natural History Society in Eastbourne I stated: "I would rather sleep with a case of small-pox than a case of influenza," and for having stated this I am alluded to as "Eastbourne's sensible M.O.H." It will interest your readers to know that this statement is a part of a sentence which was completed to this effect: "Because I have been vaccinated against small-pox and keep myself re-vaccinated from time to time."

The *Vaccination Inquirer* is, I understand, circulated to medical men, and the passage might very well give the impression that I did not believe in vaccination. The facts are that I was giving an address on vaccination and similar matters at the meeting of the Natural History Society, and was taking the opportunity of rubbing in the importance and advisability of vaccination and re-vaccination, explaining carefully the reasons for my doing so.

It is interesting to know that anti-vaccinators can take a part of such a statement as I made and twist it so that it would appear that my opinion is diametrically opposite to that which I stated in full at the meeting. The statement in the *Vaccination Inquirer* may not be a matter altogether of bad faith on the part of the writer in that paper, for his information was got from a local paper in which a contributor, who is a prominent anti-vaccinator, made the original statement.

I am, Sir, yours faithfully,

W. G. WILLOUGHBY,

Sept. 8th, 1925. Medical Officer of Health, Eastbourne.

** We have received from the President of the National Anti-Vaccination League a pamphlet on the vaccination question, asking for assistance on the ground of "the power of the press in all matters." The power of the press is sadly minimised when misquotations of the sort complained of by Dr. Willoughby occur. Dr. Willoughby suggests that the editor of the *Vaccination Inquirer* was misled, but the error should be rectified now.—ED. L.

RHEUMATIC INFECTION IN CHILDHOOD.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of August 15th (p. 341) seems to endorse the view of Dr. Robert Hutchison and others that rheumatic infection is not a poverty disease. But the figures given in the discussion do not appear to me to warrant their deduction. In 48 per cent. the wages, it is stated, do not exceed 7s. per head, or, say, for a family of eight a total of £2 16s. per week. Why, to house a family of eight decently the rent would be at least 16s., whilst clothes, boots, &c., would amount to another 2s. per head or 16s. for all, to say nothing of paying into a club, saving for a rainy day, tobacco, entertainments, &c., so that there remains but 24s. to feed a family of eight for the whole week, and yet Drs. Coates and Thomas think this not poverty. How much milk at 10d. per quart is likely to be bought for such a household? Would any eggs at 4d. each ever be consumed by a single child? Yet such important lime-bearing foods as milk and eggs are essential for the good health of children.

In my investigations, which I have carried out with Dr. Tighe and which comprise more than 44 children, it was found that nearly all the post-rheumatic or post-choreic heart cases occurred in those who took neither milk nor eggs. I divide children into two classes—viz., milk-drinkers and non-milk drinkers. Of this latter class there are those who aggravate their poor intake of lime-bearing food by partaking

largely of vinegar, sauces, and sour things generally, thereby helping still further to deplete the system of lime; this subclass I call the "acid class," from which in my experience all the cases of rheumatic fever and chorea arise.

The inadequate intake of lime and its aggravation by the consumption of acid and sour things constitute a predisposition which, in my opinion, requires but a protein sensitisation such as occurs when children are bitten by harvest bugs, midges, fleas, sand fleas, and the like, to give rise either to rheumatic fever or chorea.

I am, Sir, yours faithfully,

G. ARBOUR STEPHENS,

Consulting Cardiologist, Welsh National Memorial Association.
Swansea, Sept. 6th, 1925.

MOSQUITO CONTROL IN ENGLAND.

To the Editor of THE LANCET.

SIR,—Referring to the account, given in your issue of Sept. 5th (p. 526), of the formal opening at Hayling Island of the well-equipped building provided by Mr. John F. Marshall to house the recently constituted British Mosquito Control Institute, it is curious that although during the past 28 years enormous advance has been made in the control of mosquito-borne disease, and that British scientists, notably Sir Ronald Ross, have taken a leading part in this work, yet, with the exception of the now well-known investigations of Mr. Marshall, the subject of mosquito control in this country has been almost entirely neglected.

In the absence of endemic malaria the mosquito problem has not been such a vital question in this country as in many other places; at the same time, even in this country, there are numerous districts in which the residents suffer severely from the bites of these insects, and fatal results are by no means unknown. Apart, however, from serious injury to health, the nuisance and irritation caused by these insects become at times almost unbearable. The success which has attended the efforts of Mr. Marshall in Hayling Island is likely to lead to a demand for the adoption of measures for mosquito control in many other places, and to any of my fellow medical officers of health, upon whom may devolve the duty of dealing with the mosquito nuisance, I would suggest that an application to Mr. Marshall and his colleagues at the British Mosquito Control Institute would secure advice and assistance which would materially promote the success of their efforts in this direction. I can testify from personal experience both to the scientific and thoroughly practical character of the work which has been carried out at Hayling Island, and to the courteous and ready response to applicants for advice.

I am, Sir, yours faithfully,

A. MEARNS FRASER, M.D.,

Sept. 8th, 1925. Medical Officer of Health, Portsmouth.

MEDICINE IN RUSSIA.—About six million cases of malaria have been recorded throughout the Union of Socialist Soviet Republics in 1924. As a certain number of cases remain unrecorded this figure is a minimum. The death-rate did not exceed 5-6 per cent. of the total number of victims, even in the Caucasus and Astrakhan regions where malaria is most prevalent. The People's Commissariat for Health, and its provincial branches, carry on an anti-malaria campaign, having at their disposal 163 equipped malaria stations, six tropical institutes for scientific study, and a number of clinics served by a special staff. 75,000 kilogrammes of quinine have been imported to U.S.S.R. during this year, and 6000 kilogrammes have been distributed, free, to the population. In addition to this amount the "Zusstrah" (Central Organisation for the Social Insurance of Workers) has purchased abroad and distributed among the workers about 2000 kilogrammes of quinine.—To locate the leprosy centres in Siberia is the object of a scientific expedition which is leaving Irkutsk under the leadership of Dr. Perevodchikov. In his opinion one of such centres must exist east of the Baikal Lake: there are also indications that one lies in the region of Barbusin, in the Buriat Republic.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—An intensive course in General Medicine, Surgery, and the Special Departments will be given at the Westminster Hospital from Sept. 21st for two weeks. The Brompton Hospital will start a fortnight's course in Diseases of the Chest on Sept. 21st. Full particulars and syllabuses of the courses, together with the Fellowship programme, may be obtained from the Secretary, 1, Wimpole-street, London, W. 1.

OPENING OF THE MEDICAL SCHOOLS.—The following functions will be held in connexion with the opening of the undermentioned London medical schools:—

St. Bartholomew's Hospital.—Old students' annual dinner, Thursday, Oct. 1st, in the Great Hall of the hospital. Chairman: Mr. J. Adams.

St. Mary's Hospital.—Past and present students' annual dinner, Monday, Oct. 5th, at the Connaught Rooms, Great Queen-street. Chairman: Mr. Leslie Paton.

Middlesex Hospital.—In the Queen's Hall, Thursday, Oct. 1st, at 3 P.M., prize distribution by the Hon. Sir Arthur Lawless; inaugural address by Dr. C. E. Lakin on Tradition in Medicine. Annual dinner, Thursday, Oct. 1st, at the New Criterion Restaurant, Regent-street. Chairman: Sir Arnold Lawson.

Westminster Hospital.—Inaugural address by Prof. A. E. Gardner, Thursday, Oct. 1st, at 3 P.M., in the board room of the hospital. After the address Prof. Gardner will unveil in the hospital laboratories a tablet commemorating the generous endowment of pathological research work by Mr. A. J. H. Carhill.

ROYAL DENTAL HOSPITAL OF LONDON.—The distribution of prizes to the school of dental surgery will be made by Sir John Bland-Sutton at the hospital on Monday, Oct. 5th, at 4 P.M.

UNIVERSITY OF LONDON.—Applications for the Julius Mickle Fellowship must be made before Oct. 1st. The Fellowship, which is of the value of at least £200, is awarded by the Senate to the man or woman who, being resident in London and a graduate of the University, has, in the opinion of the Senate, done most to advance medical art or science during the preceding five years.

UNIVERSITY OF DURHAM.—Post-graduate instruction will be held in clinical medicine, clinical surgery, and pathology on each Thursday from Oct. 1st to Dec. 10th, and courses in various special subjects will also be held weekly. A detailed syllabus may be obtained from Prof. R. Howden, College of Medicine, Newcastle-upon-Tyne.

UNIVERSITY OF PARIS: Pathological Anatomy.—An advanced course on this subject will commence on Monday, Oct. 5th, under the direction of Prof. G. Roussy, assisted by many distinguished collaborators from Paris and other medical centres of France. The course is open to French and foreign doctors and students and the fee is Fr.150. Full particulars and the syllabus may be obtained from Dr. Leroux, 21, Rue de l'École de Médecine, Paris.

INTERNATIONAL CONGRESS OF HYDROLOGY AND MEDICAL CLIMATOLOGY.—The eleventh congress of this series will be held in Brussels from Oct. 11th to the 13th, under the presidency of Dr. Modeste Terwagne. Full particulars may be obtained from the general secretary, Dr. René Beckers, 36, Rue Archimède, Brussels.

CARDIOLOGY.—A special two weeks' course in cardiology will be held at the National Hospital for Diseases of the Heart, Westmoreland-street, Marylebone, W. 1, from Oct. 5th to 16th. The course includes lectures, demonstrations, clinical and pathological. As the course will be limited to 16 participants, early application should be made to the Dean, Dr. B. T. Parsons-Smith, from whom copies of the syllabus may be obtained.

RONTGEN SOCIETY.—The following are the officers and members of council for the session, 1925-26:—President: Dr. F. W. Aston, D.Sc., F.R.S. Vice-Presidents: Dr. Robert Knox, Dr. N. S. Finzi, Prof. A. W. Porter, D.Sc., F.R.S. Hon. Treasurer: Mr. Geoffrey Pearce. Hon. Editor: Dr. G. W. C. Kaye, D.Sc. Hon. Secretaries: Dr. E. A. Owen, D.Sc., Dr. Russell J. Reynolds. Council: Dr. G. B. Batten, Dr. H. A. Colwell, Prof. J. A. Crowther, D.Sc., Dr. E. P. Cumberbatch, Mr. A. K. Glover, Dr. J. E. A. Lynham, Dr. J. M. Woodburn Morison, Dr. G. H. Orton, Mr. C. E. S. Phillips, Prof. S. Russ, D.Sc., Mr. W. E. Schall, Dr. G. Shearer, D.Sc.

ROYAL PHOTOGRAPHIC SOCIETY.—The annual exhibition will be held at the house of the society, 35, Russell-square, London, W.C. 1, from Sept. 14th to Oct. 24th. Admission is free.

METROPOLITAN EAR, NOSE AND THROAT HOSPITAL.—The eighty-sixth annual report of this institution records (in tabular form) a successful year of work. Over 3000 out-patients and nearly 600 in-patients have been received and treated for conditions ranging from wax in the ear to lupus of the fauces, and from globus hystericus to ethmoidal sarcoma. Two special evening clinics for pensioners are still being held, and nearly 200 ex-soldiers have been treated. The average total cost of each in-patient is now £3 per week, a decrease of £1 4s. 9d. on 1923.

THE LATE DR. B. W. DAKERS, OF KENYA.—Bernard William Dakers, L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glas., died at Kisumu, Kenya Colony, on July 16th. Dr. Dakers qualified in 1906 and entered the Kenya Civil Service in June, 1920. He was the first medical officer to be stationed in South Kavirondo. He was employed throughout in native reserves. There he won, by his sympathy and tact, the confidence of the local native population, and was very largely instrumental in popularising European methods of treatment.

NEW BETHLEM HOSPITAL.—It is stated in the annual report of Bethlem Hospital that the Monks Orchard estate, to which the institution is to be removed, cost a little under £36,000. The average weekly cost of the patients was £5 1s. 7d. The scarcity of female nurses (in the words of the report) "still causes much anxiety." One half of the patients pay amounts ranging up to £3 2s. per week.

BELGRAVE HOSPITAL FOR CHILDREN: PAYING PATIENTS.—Early next year a ward is to be opened for the admission of patients whose parents can afford to pay the cost of maintenance (about £3 per week) and a small fee to the physician or surgeon in attendance. This cannot be done until the new west wing, now being built, is finished. This wing will afford sufficient accommodation for the nursing staff, which is now inconveniently housed in three different buildings.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL: MIDWIFERY TRAINING.—The annual report of this hospital shows that out of 123 pupil midwives who sat for the C.M.B. examination only four failed. Henceforward the period of training will be 12 months instead of six, save in the case of pupils who hold a certificate of three years' training in general nursing, in which case the period will be six months instead of four as hitherto.

A FOUNDER OF HOSPITALS.—Canon J. O. Stephens, who died last week at the age of 93, while holding the benefice of Savernake in 1866 founded and endowed Savernake Cottage Hospital, Marlborough, which provides medical and surgical help for 54 rural parishes in Wiltshire and Berkshire. When, in 1879, he left Savernake to become rector of Blankney in Lincolnshire, he was the prime mover in the foundation of the Alexandra Hospital at Woodhall Spa.

A RECOVERY HOSPITAL FOR HUDDERSFIELD.—The board of management of Huddersfield Royal Infirmary have purchased for £10,000 the Green Lea estate, Lindley, with the intention of creating a recovery hospital. It is proposed that, for the present, surgical cases shall be removed thither for recovery, but that eventually the existing infirmary itself shall be used as an out-patient and casualty hospital, in-patients being treated at Lindley, which is 700 feet above the sea. The Green Lea estate is between 13 and 14 acres in extent.

LEEDS PENSIONS HOSPITAL.—Rapid progress is being made with the new Military Hospital at Gledhow, Leeds, which, when completed, will be a centre for ex-Service men from the north of England. It will accommodate between 200 and 300 patients and 80 nurses, and will cost £160,000. The buildings will include a cinema hall.

THE LATE DR. W. B. LIVERMORE.—William Barclay Livermore, M.D. Aberd., of Exeter, died on August 24th in a Plymouth nursing home of cerebral hæmorrhage at the age of 62. Born in Aberdeenshire, he was educated in Elgin and at the Aberdeen Gymnasium. He received his medical training at Aberdeen University and at Westminster Hospital, graduating M.B., C.M. Aberd. in 1883. After some experience in private practice at Cleckheaton, Yorkshire, he took up the study of tuberculosis and was appointed medical superintendent to the Devon and Cornwall Sanatorium for Consumptives, Didworthy, South Devon. Under Dr. Livermore's administration, which extended over 15 years, this institution increased in capacity from 20 beds to 76. On his retirement he was appointed to the consultant staff.

ST. BARTHOLOMEW'S HOSPITAL WAR MEMORIAL.—The archway beneath the north wing of the hospital is to be utilised for the erection of a war memorial to St. Bartholomew's men.

ROTHERHAM HOSPITAL.—On Sept. 7th Princess Mary opened a much-needed extension of Rotherham Hospital, which was last enlarged nearly 30 years ago. The additions have cost £20,000, practically the whole of which has already been subscribed.

PRESENTATION TO A MEDICAL MAN.—Dr. W. J. L. Ffrench, of Barnetby, Lincs, who has been identified very prominently with the public life of the district for 30 years, was recently presented with a silver salver and a cheque for £207.

THE HASTINGS TOWN COUNCIL has decided to acquire the lease of the White Rock Bathing Establishment, now leased by the corporation to a private organisation which is ready to surrender the balance of its term. If the council carries out its design, it should take over the baths as from Sept. 30th, when it will be necessary to spend a large sum to bring the establishment up to high standard, and this policy is to be followed.

THE PRINCE IN ARGENTINA.—H.R.H. the Prince of Wales recently visited the "Oxo" supply ranches in Argentina. Some 15 or 16 years ago a special commissioner of THE LANCET was sent to Argentina to investigate the circumstances in which the "Oxo" products were prepared, and his long and interesting report will as well repay study to-day as then. (Vide THE LANCET, 1908, ii., 1233.)

THE "PAUPER TAINT."—Mr. Richard Turley's seat on the Leeds board of guardians has been declared vacant because he has become an in-patient of the Poor-law infirmary. Mr. Turley was taken thither in a semi-conscious condition because there was no bed available at Leeds General Infirmary. He is a paying patient, yet under the Local Government Act of 1894 he has not only lost his seat but is disqualified for re-election for 12 months.

KEIGHLEY'S CHILD CONVALESCENTS.—Sir Prince and Lady Prince-Smith have provided and opened the Southburn Children's Home in the Yorkshire wolds near Driffield for child convalescents from Keighley. The former residence of Sir Prince-Smith's land agent has been adapted for the purpose, and the inmates are to be "children of deserving parents who cannot afford to pay for convalescent treatment," who will be taken either from Keighley Hospital or upon a doctor's recommendation.

THE LATE DR. J. MURDOCH BROWN.—James Murdoch Brown, M.D., F.R.C.P. Edin., died at his residence in Edinburgh on Sept. 3rd. Although he had been retired from active practice for many years, he was at one time one of the best known practitioners of the city. He graduated M.B., C.M. at Edinburgh University in 1874 with first-class honours and was Ettles Scholar of his year, and in 1878 became a Member of the Royal College of Physicians of Edinburgh, obtaining the Fellowship two years later. He gained the M.D. Edin. in 1897. Dr. Brown for many years held the office of justice of the peace for the county of Edinburgh.

DONATIONS AND BEQUESTS.—Sir William Northrup McMillan, of St. Louis, Missouri, U.S.A., and of Kenya Colony, left among other bequests \$250,000 to the Scott Sanatorium, Nairobi, British East Africa, as an endowment. —Mr. Richard Fenwick, Edgbaston, Birmingham, left £6000 to the University of Birmingham for a scholarship or scholarships upon such terms and conditions as the governors in their discretion should think fit, and £200 each to the Birmingham Maternity Hospital and the Birmingham Royal Institution for the Blind.

Appointments.

CAPON, NORMAN BRANDON, M.D. Liverp., has been appointed Hon. Physician to the Royal Southern Hospital, Liverpool.

Vacancies.

For further information refer to the advertisement columns.

Birmingham General Hospital.—Asst. S. £50.
Blackburn County Borough.—Asst. M.O.H. £600.
Bradford Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.
Brighton County Borough Sanatorium.—Res. M.O. £350.
Brighton, New Sussex Hospital for Women and Children.—Hon. Radiologist.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—H.S. £100. Also Jun. H.S. £50.

Chester Royal Infirmary.—Hon. Asst. S.
Colwyn Bay and Colwyn Urban District Council.—M.O.H., &c. £750.
Denbigh County Council.—Asst. M.O. £600.
Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £100.
Durham County Council.—Asst. Sch. M.O. £600.
Evelina Hospital for Children, Southwark, S.E.—H.P. at rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.P. and Asst. H.S. Each at rate of £150.
Glasgow Royal Infirmary.—Supt. £800.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Asst. P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each at rate of £50.
Hospital for Tropical Diseases, Endsleigh Gardens, N.W.—H.P. At rate of £110.
Lambeth Parish Hospital, Brook-street, Kennington, S.E.—Jun. Asst. M.O. £200.
Lister Institute of Preventive Medicine, Chelsea Bridge-road, S.W.—Jenner Memorial Research Studentship. £250.
London Hospital, E.—First Asst. and Referee to one of the Five Surgical Firms. £400.
Macclesfield, Cheshire County Mental Hospital, Parkside.—A.M.O. £350.
Manchester and District Radium Institution.—Asst. Radiologist. £500.
Manchester Royal Infirmary.—Res. Clin. Pathologist. £50 for six months.
Manchester, St. Mary's Hospitals.—Three H.S.'s. Each at rate of £50.
Manchester University.—Asst. Lecturer in Chemical Pathology. £400.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Anaesthetist.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. S.
Nottingham Children's Hospital.—Res. H.P. and Res. H.S. Each at rate of £150.
Pharmacological Laboratories of the Pharmaceutical Society of Great Britain.—Director. £1200.
Prince of Wales's General Hospital, Tottenham, N.—H.S., Spec. H.S., and H.P. Each at rate of £150. Also Jun. H.S. and Jun. H.P. At rate of £110.
Radium Institute, 16, Riding House-street.—Cancer Research Worker. £500.
St. Pancras Hospital, &c.—Sen. Asst. Med. Supt. £400.
Singapore, Straits Settlements.—Two Asst. Health Officers. \$7200.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P., three H.S.'s. Each at rate of £50. Clin. Asst. £1 1s. per attendance. S. to Ear, Nose, and Throat Department.
West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each at rate of £100.
Whipps Cross Hospital, Leytonstone.—Specialist Consultant in Light Treatment. £300. Res. Asst. M.O. £350.
The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments for Certifying Factory Surgeons at Purfleet, Essex, and Ramsgate, Kent.

Births, Marriages, and Deaths.

BIRTHS.

GREEN.—On Sept. 1st, at Chippenham House, Monmouth, the wife of J. G. Green, M.B., B.Ch., B.A.O. N.U.I., F.R.C.S.I., of a daughter.

MARRIAGES.

CURRY.—REA.—On Sept. 5th, at St. Clement Danes Church, Strand, Henry Donald, eldest son of the late H. G. Curry and Mrs. Curry, of Stradell-road, Herne Hill, to Helen Gladys Rea, L.R.C.P.I. and L.M., L.R.C.S.I., younger daughter of J. C. Rea, of Howth, Co. Dublin.
HUME.—POOLE.—On Sept. 3rd, at Westcliff-on-Sea, John Basil Hume, M.B., F.R.C.S., to Marjorie Constance, daughter of Mr. and Mrs. Fredk. Poole, of Westcliff.

DEATHS.

BATTY.—On Sept. 1st, at Broadoak Cottage, Newnham, Brig.-Surgeon Richard Hamilton, I.M.S. (retired), L.R.C.S.I., L.S.A., aged 84.
BROWN.—On Sept. 3rd, at Strathearn-road, Edinburgh, James Murdoch Brown, J.P., M.D., F.R.C.P. Edin., aged 77 years.
CHURCHWARD.—On Sept. 4th, suddenly, at Selhurst-road, South Norwood, Albert Churchward, M.D. Brux., M.R.C.S. Eng., M.R.C.P. Edin., L.S.A.
ESKRIDGE.—On August 31st, Richard Bertram Eskridge, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., Royston, Barnsley, Yorks, aged 62.
LOVE.—On Sept. 6th, at Downpatrick, Ireland, Gilbert Love, M.D., B.Ch., B.A.O.R.U.I., of Great Budworth, Cheshire, the result of an accident.
ORR.—On Sept. 2nd, at Templepatrick, Co. Antrim, James Orr, L.R.C.P. & S. Edin., M.O. and M.O.H. Templepatrick Dispensary District.
RENTOUL.—On Sept. 3rd, at Hartington-road, Liverpool, Robert Reid Rentoul, M.D. R.U.I., L.R.C.P. & S. Edin., M.R.C.S. Eng., aged 70.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NATIONAL INSTITUTE FOR THE BLIND.

THE report of the executive council of this institution for the year ended March, 1925, is a gratifying record of the way in which the care of the blind has regained the support of the general public. After passing through lean years, the Institute is now in a position to extend its activities in the wider fields of former years; during the period under review, a third "Sunshine House" (Blind Babies Home) has been opened at Leamington Spa, Warwickshire, a convalescent and holiday home has been established at St. Leonards-on-Sea, Sussex, the publication of Braille literature has been considerably increased, and the price of Braille books and periodicals reduced. Among the many training departments of the Institute the school of massage is one which offers particularly good opportunities, for massage is pre-eminently a profession in which the blind can compete with the sighted. This school is recognised by the Board of Education. The special training given to blind students in medical electricity is in charge of Dr. Murray Levick, and a blind masseur who has specialised in the subject has been appointed on the staff to give instruction in the theory of electricity and the construction of batteries. The total number of blind civilian masseurs and masseuses on the register of the massage department is 100, and great care is given to the settlement of pupils after qualifying. During the past term Sir Jenner Verrall delivered a special course of lectures to blind students on modern orthopaedics. The report, which incorporates the annual reports of the Clifton Home for Blind Women, the Home Teaching Society for the Blind, and the Moon Society makes stimulating reading, and concludes with an invitation to all interested to visit the headquarters of the Institute at 224-26-28, Great Portland-street, London, W. 1.

THE WEB OF LIFE.

THE first fortnightly part has just appeared of a new serial by Prof. J. Arthur Thomson entitled "A New Natural History: Nature's Wonder-land." Justifying his ambitious title Prof. Thomson points out how the study of living creatures is undergoing a subtle change and how our knowledge must be readjusted to meet this change. His own attitude towards animal life has brought him to think of animals not only as threads in a wavering web of life but as personalities of a sort which may share in their own further evolution. The first instalment, which is profusely illustrated, opens with a chapter on the Web of Life, in which the author sets out the linkage between bird and plant in the relation between mistle-thrush and mistletoe, and the more complicated alliance in the petiole of a species of laburnum between plant, beetle, and mealy-bug. How such an alliance began he hardly attempts to explain, and the chapter ends on a note of inquiry which may well induce the reader to pursue the subject further. The great value of Prof. Thomson's work seems to us to lie in his power of setting out broad principles in an engaging manner, producing in his readers a taste for investigation on their own account. Moreover, the alliance of visible organisms in the web of life may be of help to the reader in visualising the inter-relations between microscopic cells on which organic function within the species depends. The work is to be completed in about 20 fortnightly parts at the price of 1s. 3d. each. (Geo. Newnes.)

NURSERY PSYCHOLOGY.

A SERIES of six lectures will be held this autumn at Carnegie House, 117, Piccadilly, on Everyday Psychology in the Nursery. These lectures are a further series of those held in the summer and the previous autumn, which proved to be a success. They will be welcomed by mothers who are anxious to hear the best authorities on various aspects of child life and difficulties. Amongst the lecturers are Dr. Hector Cameron, Sir Bruce Bruce-Porter, and Dr. Leonard Williams. There will be one special lecture for mothers and fathers on Family Discipline, by Dr. H. Crichton-Miller, on Thursday, Dec. 10th, from 6 to 7 P.M. The fees for these lectures are 7s. 6d. for any single lecture, or £2 for the series of lectures, and 15s. for two tickets for the special lecture by Dr. Crichton-Miller. The lectures will be under the headings of the Psychology of Infancy; Dangers of Tradition in the Nursery; Heredity and Environment; Habits and Subconscious Mind; Temperament; and Problems of School Age. These lectures take place on Thursdays, commencing Oct. 29th, at 3.15 P.M., and time is given at the end of each lecture for questions to be asked. Tickets may be obtained from Viscountess Erleigh, 65, Rutland-gate, S.W. 7, and Mrs. Ernest Shaw, 65, Conduit-street, W. 1.

THE PROFESSIONAL CLASSES AID COUNCIL.

UNDER this name the Professional Classes War Relief Council, instituted in October, 1914, has continued since 1920 its valuable work among those unpensioned sufferers from post-war conditions known as the new poor. How necessary such work is can be gathered from the fourth annual report of the Council for the year ending April, 1925, during which period 686 applications for help were received. The Council gave financial assistance—in many cases considerable—to 150 families, thus benefiting 344 individuals, and, in addition, 305 were advised where to obtain help. The scope of the Council's work is entirely dependent on the extent of the financial support it receives, and subscriptions will be welcomed by the treasurer at 251, Brompton-road, London, S.W. 3.

NATIONAL SOCIETY FOR THE PREVENTION OF CRUELTY TO CHILDREN.

THE Society's forty-first report shows the encouraging fact that neglect of and cruelty to children is gradually decreasing. The proportion of cases reported by the public is 62.5 per cent., larger than ever before, while the proportion discovered by inspectors is lower than in any previous period. In 1898 there were 2192 prosecutions and in 1924 there were 882. In recent years there has been a steady increase in the number of parents themselves seeking the advice and aid of the Society. There has also been a reduction in the number of instances where the children have had to be removed from the care of their parents. The conditions of life for children on canal boats is still unsatisfactory, and the Society has prepared a statement of facts for submission to Members of Parliament. It is hoped to secure legislation excluding children of school age from canal boats. The Guild of Good Courage consists of girls and young women who have been in the Society's legal custody as children and like to continue their association; it has a membership of 99. The medical branch has dealt with 700 cases, ranging from defective eyes and teeth to venereal disease, epilepsy, and chorea, and many cripples have been successfully operated on. A dinner in aid of the funds of the Society is to be held at the Guildhall on Nov. 25th. H.R.H. the Prince of Wales has graciously consented to preside and Sir W. Joynson-Hicks will speak. As the report says: "There is really no limit to what can be done to make life endurable for children if only all who are concerned in their welfare will coöperate to this end. Knowledge spreads slowly, and every time a new helper is secured the possibility of further usefulness is extended."

A GENEROUS OFFER.

A CORRESPONDENT writes: "A gentleman in a luxuriously appointed motor-car, whom I lately met on Exmoor, handed me a prodigious page of advertisement, containing an offer that should not be kept for one moment from the knowledge of your readers. You are too prejudiced to regard my plea for an open mind; yet I may remind you that these are days of overcrowding and competition when many a young man finds it hard to get his foot upon the ladder of success: £1000 per annum will be paid by my motoring acquaintance as salary to a qualified medical man who should possess the following qualifications. He must be able to make the blind to see, the deaf to hear, and the lame to walk. These biblical qualifications must be reinforced by ability to make flesh grow on withered limbs at the rate of a quarter to half an inch—whether this growth refers to thickness or superficialities is not clear (as you will see by the advertisement which I enclose), but from hints dropped in conversation by the advertiser I infer that thickness is meant. Further, the applicant must be capable of curing 'undeveloped brain'; a vista of psychological possibilities thus opens into infinity. Two of the remaining qualifications required in the successful aspirant are a complete summary of professional competence—he must be able 'to inform patients what is the nature of their complaint, and its duration.' Here the power of diagnosis comes in. Lastly, it seems that he should be able to subdue pain in his patients without the use of drugs or anaesthetics, and above all to transmit vitality without contact. Apparently he is not expected to possess these abilities, but to acquire them by contact with the inventor, who states that 50,000 people have been already successfully treated and are walking testimonials to magnetic treatment. For his position will be that of an assistant who must submit to all rules and obey all regulations laid down by his principal and must act constantly as his locum tenens, showing as good a percentage of cures by pursuing the same methods." As the advertiser succeeds in curing vast series of cases of "undeveloped brain" his business will diminish in ratio; so along one line of his activities we wish him luck. But we can hardly imagine any newspaper conducted by an editor with a brain sufficiently undeveloped to sanction the publication of this advertisement.

OBLITERATION OF TATTOO MARKS.

To the Editor of THE LANCET.

SIR,—Some years ago a patient of mine, a young woman, was tattooed on both legs. The present fashion of short skirts and thin stockings make the marks unduly prominent. Is there any method by which tattoo marks may be obliterated? I shall be grateful if any of your readers can tell me.

I am, Sir, yours faithfully,
Sept. 4th, 1925. M.B., &c.

THE PATIENT AS DIAGNOSTICIAN.

To the Editor of THE LANCET.

SIR,—For the information of my colleagues in London may I bring forward this story. A certain medical man in London is advising a patient, while travelling, to obtain the services of a local medical man every week wherever he may be for the purpose of injecting hypodermically a quack nostrum for the cure of a certain disease. In my case the patient met with a flat refusal and a letter followed to the London practitioner informing him of the fact. I may say that in his letter this doctor stated he was using this stuff "at the patient's own risk and responsibility"—a glaring irregularity in my opinion.

I am, Sir, yours faithfully,
Blackpool, Sept. 3rd, 1925. PERCY HOWARD DAY.

BRITISH HEALTH RESORTS.

WE have received a communication from Mr. Lyman D. Davis, Chairman of the Foreign Relations Committee of the Anglo-American Hotel Association, in which he pays a tribute to British holiday resorts from the point of view of an American "whose business has been for many years past connected with a number of the best known pleasure resorts in Europe and America." The Briton may decry his own pleasure resorts, both inland and coastal, but when it comes to the point of deciding where to spend his holiday he prefers a home resort, and when he travels abroad he does so for knowledge rather than enjoyment. In Mr. Davis's opinion all our possible continental competitors, in spite of their vigorous advertising, have been knocked out "because the facilities provided by the hotels and railway companies, town for town and village for village, are more complete and incomparably better and safer in Britain than in any other part of Europe." It is refreshing in these days to find anything British extolled for its own sake, and Mr. Davis's encouraging words will be appreciated.

THE DISINFESTATION OF LIVING SPACES.

To rid living spaces of insects and vermin is often difficult and as yet no standard method has been agreed upon. Hydrocyanic acid can, under careful regulations, be safely used in ships in harbours, but it is hardly suitable in barracks and tenements. For destroying rats and their fleas as well as other insects on ships sulphur has proved efficacious if the ship is thoroughly sealed down for six hours, but sulphur is not without its inconveniences. We are glad therefore to find in the *Journal of the Royal Army Medical Corps* for July a report by Major D. Reynolds on Disinfestation of Rooms by Formalin. He tells us that he has secured complete destruction of bugs in infested rooms when employing, as a minimum, 2 pints of formalin (40 per cent. formaldehyde) per 1000 cubic feet, poured on 2 lb. of a mixture of one-fifth quicklime and four-fifths bleaching powder, in a warm (70° F.) and damp (70 per cent. humidity) atmosphere. The vapour is allowed to act for at least 24 hours. Unfortunately, the question of cost is not discussed: 3 lb. of sulphur would cost 7d. at current wholesale prices, but 2 pints of formalin would be 3s., plus the cost of the bleaching powder. It would be a help to medical officers of health and others concerned in the planning of disinfestation work if authors when describing new large-scale methods would mention the cost per 1000 cubic feet at which, in their experience, the methods they recommend have been carried through, differentiating if possible the cost of the materials from that of the labour employed.

CASTRATION THREATS TO CHILDREN.

WE have received from a lay correspondent an account of the disastrous effects of a castration threat directed towards himself when 3½ years old, as a punishment for an exhibitionist act. The memory of this he claims to have recovered by a process of self-analysis, and he is emphatic about the evil influence of such threats in connexion with the infantile tendency to exhibitionism, declaring that not more than two or three boys out of every ten escape some threat of this nature. This situation he links with the "castration complex," believed by psycho-analysts to be a frequent

factor in mental disturbances of later life, and he suggests that parents should tell the two-year-old boy that he must not expose his genitals, but he is not to be frightened if anyone makes a cutting off threat against these parts, whilst servants and others should be warned against making the threat, though the child is to be smacked on the buttocks, if necessary, to check the forbidden behaviour. If our correspondent's view of the results of the threat be correct the remedy seems, on psycho-analytical grounds, to be equally inadvisable, for corporal punishment of this nature has been known to arouse perverted tendencies. Assuming that children pass through an exhibitionist phase it would surely be best to regard it as unemotionally as we regard other childish peccadilloes; we do not attach great emotional value, for example, to the offence of throwing food upon the floor and yet children quickly learn that "it isn't done." The castration threat may well ferment in the childish mind and is to be condemned; our aim should be to avoid feeling or showing emotional reaction towards behaviour which is nothing more than a passing phase, but may, if psycho-analytical findings are sound, become a source of serious trouble if excessive emotion is attached to it. Our correspondent has little doubt himself that the findings obtained by careful psycho-analysis are sound although the process is frequently painful.

Oil Fuel at the London Hospital.—The governors who, a few years ago, refused to replace coal fuel with oil have now reversed their decision and have decided to build a central boiler establishment to serve the whole of the hospital, the fuel being oil. There are still 101 closed beds in the hospital.

Messrs. Kelvin, Bottomley and Baird, Ltd., 51-52, Fenchurch-street, E.C. 3, have published a new eight-page list of apparatus for ultra-violet light therapy. Their full catalogue is in course of preparation. A copy will be sent on request to anyone interested.

X. Y. Z.—The medical statisticians present at the luncheon given by the Government on August 13th were: Dr. S. Rosenfield (Austria), Dr. Camille Jaquart (Belgium), Dr. H. J. Hansen (Denmark), Dr. T. H. C. Stevenson (England), Dr. Martti Kovero (Finland), Dr. M. Huber (France), Dr. E. Roesle (Germany), Dr. Cunnar Jahn (Norway), Dr. J. C. Dunlop (Scotland), Dr. E. H. N. Arosenius (Sweden), Dr. Marcel Ney (Switzerland), Dr. W. H. Davis (United States), Dr. A. Aguirre-Sayago (Chili), Dr. Martin Kacprzak (Poland), Mr. K. Stouman, and Mr. J. Pagnod (League of Nations).

THE British Dyestuffs Corporation, Limited, of 70, Spring-gardens, Manchester, have sent us a price list of fine organic chemicals for research work, which also includes a list of indicators, microscope stains, medicinal and photographic chemicals. The stains have been prepared from selected dyes tested at the Manchester Laboratory of Applied Pathology and Preventive Medicine. The indicators offered range in a complete series from pH nil, e.g., naphthol yellow S, to pH 13, e.g., Titan yellow. The Corporation were the original manufacturers of acriflavine in this country, and euflavine is now offered, being the same compound with one molecule of HCl removed. Auramine, put up in solution as glauramine, is believed to be one of the most powerful antiseptics ever produced. New products of the urea type have also been elaborated and tested.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 14th, to SATURDAY, Sept. 19th.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Daily instruction in the Out-patient Department from 2.30 P.M. Special demonstration of cases on Tuesday, and a Venereal Clinic on Tuesday and Thursday from 5.30 to 7 P.M.—THE INFANTS' HOSPITAL, Vincent-square, S.W. Special Course. Lectures and demonstrations every afternoon. "Round Table" consultation on Friday, and on Saturday a visit to the Home for Blind Babies.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross. Clinical demonstration every afternoon from 2 o'clock with special demonstration three times a week.

Hunterian Lecture

ON

SOME DISORDERS OF THE LARYNX.

Delivered at the Royal College of Surgeons of England

By V. E. NEGUS, M.S. LOND., F.R.C.S. ENG.,
JUNIOR SURGEON TO THE THROAT AND NOSE DEPT. OF
KING'S COLLEGE HOSPITAL.

John Hunter studied the circulation of blood through the lungs, and with his accustomed practical genius he exposed part of the lungs of a dog and watched the changes taking place in them under conditions of artificial respiration maintained by specially constructed bellows. He has left on record the observations he made,¹ and writes these words:

"The diminution of the heart's motion upon stopping respiration does not depend upon the immediate impression of improper blood on the left auricle and ventricle as a sedative, but upon the sympathetic connexion which exists between the heart and lungs (one action ceasing the other also ceases); which sympathy is established, because if the heart were to continue acting it would send improper blood into the body, by which it can be supported only a little while. The right auricle and ventricle also cease acting, although not so early, and for the same reasons; because on the cessation of the function of the lungs the blood cannot receive any benefit in passing through them. These actions and cessations are all dependent on life and the connexion of one action with another."

No better words could possibly be found to express the object of the present paper. I shall attempt to describe what I imagine to be one of "the connexions of one action with another," and to show how the larynx serves an important function in preventing the heart from sending "improper blood" into the body. I wish to add what I imagine to be one link to the work carried out by Hunter and only hope that my efforts are worthy of the illustrious investigator whose researches were based on close observation, reasoned interpretation, and an earnest desire for the discovery of truth.

I wish to express once again my indebtedness to Sir Arthur Keith, who has given me facilities for research and has been ready at all times to give me advice and information derived from his store of knowledge. He pointed out to me the importance of the respiratory movements of the glottis in their bearing on the circulation of the blood, a subject to which he has given considerable attention. I am also extremely grateful to Prof. R. J. S. McDowall, both for allowing me the opportunity of making experimental observations on animals, and also for supplying facts and experimental evidence relating to respiration and circulation.

A large source of knowledge has been supplied by Prof. J. S. Haldane's book on Respiration²; so many of the observations recorded are derived from this authority that it would be confusing to refer to each one as it occurs. I have attempted to correlate the various observations and to add my humble contribution to the elucidation of that "sympathetic connexion" described by the great master.

NORMAL MOVEMENTS OF THE LARYNX.

A study of the anatomical structure of the larynx of all lung-breathing animals is but a means to the understanding of the physiology of the organ. It is only by the evidence of comparative anatomy and physiology that the multifarious functions of this important part of the body can be explained, and I intend to make use of what information is available from the literature and from personal observation in dealing with the question of respiratory movements of the glottis.

The movements of the larynx are many. The whole organ ascends in the neck on deglutition and phona-

tion. The laryngeal aperture closes on swallowing, by virtue of contraction of its muscular sphincter. The vocal cords come together during phonation, and for the alteration of intrapulmonary and intrathoracic pressure in both a positive and negative direction. The ventricular bands come together when it is desired to raise intrathoracic pressure to a great degree. And finally, the vocal cords open and shut to a greater or lesser degree during respiration, in proportion to the force of breathing.

RESPIRATORY MOVEMENTS AT THE GLOTTIS.

It is recorded in many physiological text-books and in other works that the glottis opens to a certain extent on inspiration and partially closes on expiration; as far as I know, no reason is given for these movements. As they cannot be accidental it seemed necessary to discover their object; brief allusion was made to the subject in my Arris and Gale lecture delivered in 1924.³ In the present paper it is intended to study the subject more fully, to add whatever new information has been collected, and to apply the physiological findings to the elucidation of certain conditions caused by disease. At the beginning of inspiration the glottis opens to a certain degree, which increases in direct relation to the force of inspiration; at the beginning of expiration it closes partially, and under certain conditions is almost completely closed. Exception may be taken to this statement, because in many individuals in the resting condition the glottis is apparently immobile during the phases of respiration, as pointed out in particular by Semon.⁴ In all individuals, however, it seems probable that respiratory movements occur as soon as any exertion is undertaken, while in animals such as cats, dogs, and rabbits, and in birds, reptiles, and amphibians, the opening and closure is to be seen at all times.

In those human beings who do not show variations in size of the glottic aperture during the phases of inspiration and expiration, there is, however, a change in size when an increase or decrease in depth of breathing occurs. This change in size is all that is essential to substantiate the explanation given later on as to the mechanism probably at work. Although alterations in size when present add the fine adjustment to regulation of gas exchanges, it is not necessary that they should occur during the different phases of respiration.

The mechanism is extremely complicated, but without discussing in detail the many factors at work, an attempt will be made to give a short description of the chief objects of the movements as they apply to man.

Relation of Respiratory Movements at the Glottis to Alveolar CO₂ Content.

The main function seems to aim at keeping the reaction of the blood constant. This is attained by the provision of a fine adjustment for the regulation of air entry into the lungs, the degree of washing out of CO₂ from the alveoli, and the correlation of these actions with the flow of blood through the lungs. A word may be said with regard to gas exchange in the lungs. Atmospheric air contains 20.96 per cent. of oxygen and 0.04 per cent. of CO₂. "Alveolar air," obtained at the end of the deepest expiration, is found to contain oxygen 13 per cent., and CO₂ 5.6 per cent., and the rest nitrogen.

The venous blood contains about 8 per cent. of CO₂; it is not saturated with oxygen. Arterial blood, on the other hand, is saturated with oxygen and contains the same percentage of CO₂ as the alveoli—namely, 5.6 per cent. This means that the blood absorbs oxygen and becomes saturated in its passage through the lungs and gives up about 2.4 per cent. of CO₂. The latter is removed from the lungs in the tidal air and is dissipated in the atmosphere, where the percentage is so much lower; the greater the volume of CO₂ removed from the blood, the greater the volume of tidal air changed per minute.

(a) *Mechanism during Inspiration.*—Practical equilibrium is maintained between the CO₂ percentage

of the alveolar air and that of the arterial blood; the level in the latter is generally, but not always, slightly higher than that in the former. The percentage both in alveoli and blood changes but little. Haldane states that "a rise of 0.2 per cent. or 1.5 mm. in the CO_2 pressure of the alveolar air and arterial blood causes an increase of about 100 per cent. in the resting alveolar ventilation."² Any rise of CO_2 percentage in the blood would tend to cause a change in the reaction of the blood, but for the action of buffer substances, notably the bicarbonates and phosphates. The CO_2 percentage in the arterial blood which leaves the lungs to nourish the tissues is of primary importance, because the tissue cells are intolerant of changes in reaction of the medium which nourishes them, and numerous devices are present to ensure constancy of reaction, which is, in fact, slightly on the alkaline side.

The breathing is regulated to keep the arterial percentage of CO_2 constant, and variations are met by alteration of depth rather than of rate; only after big changes is the rate altered.² Such alterations will, however, do no more than regulate the average percentages over several respirations. Evidence will be put forward which indicates that glottic movements greatly assist in keeping the interchange of CO_2 , and hence the blood reaction, practically constant during all phases of respiration.

When inspiration commences the opening of the glottis slightly precedes the moment when expansion of the thorax and descent of the diaphragm commence; there is provided an inlet of a certain calibre in accordance with the immediate needs of the body. In some individuals the size of the glottis is not varied at each respiration, as was pointed out above. The glottis is a choked point on the air-way at all times, even when opened to its maximum extent, and therefore there is always delay in filling of the thorax, even when the force of inspiration is very gentle.

When the capacity of the thorax is enlarged air cannot enter sufficiently quickly to fill the increasing space, and there is consequently a temporary diminution of both intrathoracic and intrapulmonary pressures. When inspiration is gentle the glottis is opened to a slight degree only; the gentle force drawing in air produces a certain degree of negative pressure. When inspiration is powerful the glottis is more widely opened. But a greater volume of air is required to fill the lungs, and although the glottic inlet is wider, yet there will again be negative pressure. And if the force of inspiration be very powerful, the diminution of pressure will be greater than before.

In all cases the results of these actions are much the same; the laryngeal obstruction causes the lungs to be filled gradually instead of suddenly. As breathing is kept automatically at a fixed rate by the control of the respiratory centre, there would be the same number of inspirations every minute, whether the required volume of air entered the lungs gradually or suddenly. The chief reason for the prolongation of air entry appears to be directed to washing out of CO_2 from the blood. The gradual entry of air during inspiration leads to gradual dilution of alveolar air, whereby the percentage of CO_2 is kept at a more or less constant level in the alveoli, and consequently in the blood. Haldane has shown that, because of the large reservoir of air always present in the lungs, the alveolar CO_2 never changes much.² Only about one-eighth, or perhaps rather more, of the air-content of the alveoli is changed on gentle respiration; Keith gives the figure as one-fifth.⁵ The volume changed at each respiration increases on exertion; therefore the buffer provided by the reservoir of air in maintaining constancy of CO_2 is less at such times than during rest.

Even during gentle respiration there must be a content of CO_2 in the alveoli gradually tending to rise in percentage from the time when dilution with inspiratory tidal air has reached its maximum point until the next similar phase. It must be remembered that when samples of alveolar air are examined they

are invariably taken at the end of the deepest expiration. The sample comes from mixed alveolar air and represents the last part of supplemental air; but it only gives an indication of the percentage of CO_2 present in the alveoli at the end of each expiration. If a sample be taken immediately after a forced inspiration results are given differing from what is found by the ordinary method. As the blood leaving the lungs will contain a CO_2 percentage almost equal to that in the alveoli, there must be some mechanism by which the percentage is kept constant; otherwise the CO_2 in the blood would gradually drop towards the end of inspiration and rise during expiration.

Maintenance of uniformity of CO_2 content of the blood seems to be dependent on the volume of blood flowing through the lungs and its relation to the air-content of the alveoli. At the beginning of inspiration the diminished intrathoracic pressure causes more blood to be drawn into the great veins and right auricle; increased intake is aided by descent of the diaphragm, which squeezes blood out of the splanchnic area. At the same time there is diminished pressure in the lungs; this causes dilatation of the pulmonary capillaries because of the lessened air pressure both in the alveoli and on the outer surface of the lungs, as Sharpey Schafer has demonstrated.⁶ There is another important factor described by Lewis⁷—namely, diminution of pressure on the pericardium, as distinct from suction action on the great veins and right auricle. The heart's rate is increased among other results; this and the other effects may be shown readily by experiment.

The mean result of these various factors is that more blood is received by the right auricle, and more is pumped through the freely open capillaries. At the beginning of inspiration the air rushing into the alveoli tends to lower the CO_2 percentage; at the same time an increasingly large volume of blood rushes through the capillaries, and from it a certain volume of CO_2 is washed out. Towards the end of inspiration the dilution of CO_2 in the alveoli is at its height, and intrathoracic and intrapulmonary pressures are at the same moment at a lower level than at the beginning of inspiration. Therefore, more blood flows through the lungs and a greater total volume of CO_2 is withdrawn. The result is that the CO_2 content of the arterial blood leaving the lungs is kept constant.

That a greater volume of blood passes through the lungs during inspiration than during expiration may readily be demonstrated by Valsalva's experiment. If the changes in dilution of alveolar CO_2 described did not take place, the blood leaving the lungs during inspiration would contain a higher percentage of CO_2 than during expiration; because the alveoli would only be able to take up the same volume of CO_2 during inspiration as during expiration. And as a greater volume of CO_2 is brought to the lungs by the increased blood-flow during the former phase, there would necessarily be retention during this period.

(b) *During Expiration* the pressure inside and outside the lungs is raised, depending to a great extent on the position of the glottis. It is found that during expiration the glottis is narrowed to a considerable degree. As already mentioned, this sudden change in size does not occur in all subjects during quiet respiration. As gentle respiration calls for a partially closed glottis on both inspiration and expiration, the mechanism described above would still hold good.

The increased pressure on the right auricle and great veins does not permit so much blood as before to enter the heart, and the increased pressure on the pulmonary capillaries does not give so free a passage to blood-flow through the lungs as during inspiration. Therefore, the amount of blood flowing through the lungs is less during expiration than during inspiration; the volume gradually decreases from the beginning to the end of the act. As the CO_2 content of the alveoli tends to rise during expiration, there will be less washing out from the blood, especially towards the

end of the phase; but as the volume of blood flowing through the lungs is itself diminishing during the same period, so the blood leaving the left heart will contain a more or less constant percentage of CO_2 .

A gradually decreasing volume of CO_2 is washed out of a gradually decreasing volume of blood, and the ratio between the two seems to be maintained by the degree of closure of the glottis. The mechanism is the reverse of that occurring during inspiration.

Relation of Respiratory Movements at the Glottis to other Factors.

What has been described appears to be the chief function of the respiratory movements at the glottis of man, although it is not a primitive function.

(a) *Oxygen-content of Alveoli and Blood.*—I had supposed that the mechanism of correlation between air entry and blood-flow was directed towards regulation of oxygen exchange; by Prof. McDowall's aid I was enabled to see the error of this view, and it was at his suggestion that I reconstructed the theory to apply to CO_2 exchange. In some aquatic mammals regulation of oxygen-content of the alveoli and blood seems to be a function carried out by the glottis; in man this does not appear to be the case. The percentage of oxygen in the alveolar air even at the end of expiration is almost always high enough to saturate the blood, and from this we see that it is obviously unnecessary for the glottis to take part in regulation of oxygen-content of the lungs.

(b) *Relation to Aortic Blood Pressure.*—The respiratory movements have a marked influence on the blood pressure, because of the factors already mentioned—namely, the increased flow of blood through the lungs during the major part of inspiration and the diminished flow during expiration. The normal respiratory waves depend to a considerable extent on the descent of the diaphragm and not merely on the alterations in pressure within the thorax; but the latter factor is the more important of the two. In comparison to the usual high level of aortic blood pressure, however, the respiratory variations would not appear capable of exerting any marked influence; they would seem to be merely incidental to the mechanism designed for regulating the reaction of the blood, and not to be directed purposely to maintenance of the blood pressure in the systemic circulation. It is the power of the left ventricle which maintains the very high pressure in the aorta.

(c) *Pump Action on Circulation.*—Sir Arthur Keith has impressed on me the great importance of another closely related factor—namely, the pump action of the respiratory movements in drawing blood through the lungs, and of thus assisting the circulation. The inspiratory pump action has already been described as regards its relation to CO_2 exchange, in which respect it appears to be extremely important. As to the assistance given to the heart in causing circulation of blood round the body, the effect is proportional to the difference between the increase of volume of blood drawn into the right heart and great veins and so to the lungs on inspiration, and the decrease of volume consequent on slight compression of the right heart, and especially of the great veins during expiration.

In relation to the work of the heart the glottic movements would seem to exert a definite and important function in conjunction with the other factors such as the mechanical compression of veins and the action of CO_2 on the venous reservoirs, which promote the return of blood to the heart and increase the rate and output of the latter. It was stated above that the movements of the glottis have little effect on the height of aortic blood pressure, because the differences noted between inspiration and expiration are slight and almost negligible when compared to the high level present in the great systemic arteries. But as regards the right side of the heart the effect is marked. The pressure in the pulmonary artery is very low as compared with that in the aorta, and any assistance given by the mechanism described during inspiration is

of great benefit in maintaining efficient circulation through the lungs. On the other hand, any obstruction offered during expiration exerts a marked influence. These variations, in allowing more or less blood to reach the left ventricle, will indirectly affect the level of aortic blood pressure, but it should be clear that there is a difference as regards the action of the glottis in the two respects—namely, that great assistance is given to the work of the right side of heart, while little is afforded to that of the left.

(d) *Effect on Hering-Breuer Reflex.*—When the lung is distended at the end of inspiration a stimulus passes up the vagus which instigates the commencement of expiration. At the end of expiration another stimulus causes inspiration to begin. The obstruction offered by the glottis to passage of air causes prolongation of the time taken to fill or empty the lung and thereby causes suitable delay in the timing of the signals for emptying or filling of the lungs—namely, the Hering-Breuer reflex. The importance of this mechanism has already been emphasised. Lumsden considers that passage of air either into or out of the air passages gives the signal referred to as the Hering-Breuer reflex.⁸ Such a view does not alter the significance of the part played by the glottis in the mechanism.

(e) *Regulation of Filling of Alveoli.*—From observation of certain facts related to comparative anatomy it appears to me that obstruction offered by the glottis during expiration may have an important effect in assisting to distribute air in the air sac systems, and in helping to fill those alveoli distally situated. The mechanism would be considerably aided by contraction of the bronchiolar musculature at the beginning of expiration, because the bronchioles contract before elasticity of the pulmonary tissue or contraction of the expiratory muscles have had time to expel air from the lungs to any marked extent.

At the same time diffusion of gases from and to tidal air is reinforced by the process of mechanical mixing, probably to a most important degree. It is suggested that air is drawn from the alveoli, air sacs, and alveolar ducts into the bronchioles at the beginning of inspiration; and that at the beginning of expiration some air is driven from the contracting bronchioles into the terminal ramifications of the lungs. The subject is too big to be discussed further at this point; it will be dealt with in a separate paper.

ALTERATIONS UNDER CERTAIN PATHOLOGICAL CONDITIONS.

Reason for Priority of Abductor Paralysis.

If the recurrent laryngeal nerve be slightly injured, there is loss of power in some of the muscles supplied by it; power disappears from the abductors sooner than from the adductors. This to me is natural, because adduction is an older function than is abduction, and therefore the power of the former survives that of the latter. *Lepidosiren*, a lung fish, has a sphincteric band of muscle at its larynx, which has the power of closing the aperture in the manner of a purse string and of protecting the delicate lungs from the entrance of irritants such as food or water. It has no abductor muscles, according to my observations, and needs none, because passive relaxation of the sphincter is all that is required to allow passage of air into and out of the lungs. In other animals such as *Ceratodus*, another lung fish, dilator fibres are present, so that opening of the glottis can be attained more rapidly and more widely; the sphincteric band is, however, of more primitive origin than are the dilator fibres. In mammals the sphincteric band is split up into various components—namely, the thyro-arytenoid, lateral crico-arytenoid, and inter-arytenoid muscles—while the dilator fibres are represented by the posterior crico-arytenoid. In an animal such as a mongoose the sphincteric group is used mainly for protective closure of the larynx, but not at all for phonation; while the dilator muscles are for opening the glottis on inspiration, just as in *Ceratodus*.

In man and many animals certain fibres of the sphincteric group are used for phonation; this is, however, a comparatively new and subsidiary function, as pointed out in my Arris and Gale lecture, and does not alter the fact that the primary object of the group is for protective closure. Therefore in man, as in lung fish, the function of adduction is of older standing than is that of abduction, and in consequence it survives longest. In cases of abductor paralysis in man the paralysed cord lies nearer to the mid-line than the cadaveric position, because of tonic contraction of the adductor group. In health the position is determined by active contraction of the abductors,⁴ balanced by opposition of the adductors, associated with resistance of elastic fibres in the crico-arytenoid joint; the latter tend to bring the cartilages and cords into the cadaveric position.⁹

Effect of Laryngeal Obstruction.

Obstruction to passage of air through the larynx may be due either to paralysis of the muscles which open the glottis or to spasm of those which close it, or to local conditions which cause mechanical blockage. If there is merely inability to abduct the vocal cords, then difficulty will be experienced on inspiration only, because of the valvular nature of the glottic margins, which are flat above and conical below. Spasm of the sphincteric muscles will produce effects similar to those of paralytic obstruction; but in the former case the condition is overcome as soon as asphyxia commences, while in the latter it is permanent. As there is nothing particular to describe in the present connexion, spasmodic conditions will not be considered separately. If the pathological process has produced marked narrowing of the laryngeal passage, then obstruction will be offered during both inspiration and expiration. Combinations of the two types of paralytic and mechanical obstruction are met with; they will give rise to mixed effects.

(1) *Inspiratory Obstruction.*—One important result of inspiratory obstruction, usually due to abductor paralysis, will be upset of the normal mechanism of washing out of CO₂ from the blood. At the beginning of inspiration in these cases there is considerable delay in the passage of air through the glottis, and therefore there is not dilution of CO₂ in the alveoli at the usual rate. But the intrapulmonary and intrathoracic pressures during this phase are lowered more than usual, because the increasing capacity of the lungs is not filled by inrushing air as quickly as is normal. The abnormal lowering of pressure in the thoracic cavity causes an unusually large volume of blood to flow through the lungs as an exaggeration of the usual increase; as the percentage of alveolar CO₂ is higher than it should be there is less of the gas washed out of the blood. Consequently the blood leaving the lungs and travelling to the tissues contains a higher percentage of CO₂ than in a normal individual during this period; a certain degree of breathlessness is produced because of this relative retention of CO₂. Towards the end of inspiration entry of tidal air reaches its maximum and there is therefore dilution of alveolar CO₂, so that blood CO₂ falls in consequence.

On expiration there is the usual mechanism of washing out of CO₂ in cases of abductor paralysis, because, although the failure of the muscles which open the glottis does not permit attainment of the desired width of the aperture, yet the abductors and elastic fibres are still capable of closing it to the requisite degree, while simple relaxation of the sphincteric muscles will allow the funnel-shaped margins to be blown open in a mechanical manner when the force of expiration is great enough to necessitate wider opening at the larynx. Therefore "sympathetic connexion" is not upset during this phase. This is the effect on washing out of CO₂ during the different phases of respiration; it is seen that the normal correlation between inspiratory entry of air and volume of blood passing through the lungs is upset, and that the CO₂ content of the arterial blood is in consequence no longer constant, tending in the mean result to be higher than usual, and thus causing

breathlessness. Other effects are due to the diminution in volume of tidal air because of the abnormal obstruction on inspiration. The CO₂ percentage of the arterial blood tends to rise if lung ventilation becomes insufficient. It is raised also because of the abnormally insufficient washing out of CO₂ at the beginning of inspiration; a combination of all these factors leads to increased stimulation of the respiratory centre.

The result will be increased effort on inspiration and a temporary compensation of the laryngeal obstruction, and return of blood CO₂ to the normal level. The increased effort is not able, however, to keep pace with the accumulation of CO₂ in the alveoli; therefore the CO₂ in the blood again rises and the respiratory centre has to accommodate itself to respond to a permanent new level. The level may reach as high as 7.5 per cent., as in a case investigated by Dr. R. D. Lawrence and myself.

As to supply of oxygen to the lungs. In the early stages anoxæmia is not produced because of the normal surplus of oxygen contained in the alveolar reservoir; the colour of the patient is therefore good. But as the total volume of tidal air per minute decreases, there will come a time when the hæmoglobin does not find sufficient of the gas to saturate it. A further factor depends on an observation made by Haldane (p. 157).² If the blood-flow through the lungs is abnormally accelerated, as it is in these cases during the early stages of inspiration, there may not be time to pick up what oxygen is available; therefore the condition of anoxæmia is aggravated. The effects of anoxæmia on the respiratory centre are to stimulate it in a jerky manner and to hasten an early failure of the controlling mechanism of respiration, which is due chiefly to the continued excessive stimulation by CO₂.

(2) *Complete Paralysis.*—Cases of complete paralysis of all the muscles controlling the glottis will show the same characters during inspiration as those already described; during expiration, however, the flabby passive opening of the aperture will not offer sufficient resistance to the current of air. The result will be that the blood-flow during expiration is not decreased to the requisite extent and insufficient CO₂ is washed out. Therefore, not only is arterial blood CO₂ excessively high at the beginning of inspiration, falling towards the end of the phase, but it also tends to rise above the normal during expiration. The total result is that the respiratory centre is abnormally stimulated and calls for increased effort on the part of the respiratory muscles. The other factors do not differ materially from those seen in abductor paralysis.

(3) *Narrowing of Laryngeal Aperture.*—There will be the same effects during inspiration as those produced in paralytic affections; during expiration, however, there is a difference. Obstruction during the latter phase leads to further decrease in the volume of tidal air per minute; it tends to prolong the Hering-Breuer reflex stimulus for inspiration, but this tendency is counterbalanced by increasing CO₂ content in the alveoli—with absolute CO₂ retention—and usually by a certain degree of anoxæmia. Therefore the rate of respiration tends to rise, while the force increases. The circulation through the lungs is impeded more than in health, because of the increased pressure brought to bear on the right auricle and great veins and on the pulmonary capillaries. Consequently, sufficient blood for the needs of the body cannot pass through to the left side of the heart during this phase of circulation; the veins become engorged with unoxxygenated blood and cyanosis appears at a much earlier stage than in cases of pure inspiratory obstruction.

(4) *Treatment of Laryngeal Obstruction.*—With regard to the treatment of cases of laryngeal obstruction, it must be remembered that prolonged deficiency in lung ventilation and upset in the correlating mechanism between air entry and blood-flow lead to increase in the percentage of alveolar CO₂ before signs of anoxæmia appear. Therefore tracheotomy should be performed early and should not be delayed until

urgent symptoms arise. When the condition has become extreme it is often necessary to perform emergency tracheotomy. By this operation lung ventilation is suddenly and enormously increased. Paradoxical as it may seem, even when obstruction has been relieved, there are some cases in which death has taken place, as Sir StClair Thomson has pointed out to me. Therefore it seems necessary to consider the causes and means of avoiding such calamities. In this respect Haldane writes that if the amount of CO_2 in the blood and tissues is greatly reduced by effective artificial respiration for some time, there is prolonged apnoea, and the animal dies of want of oxygen without attempting to draw a single breath; he states that this occurrence has been described by Yandell Henderson.² The experiment may be carried out personally by deep breathing while resting, when apnoea is produced.

Dale and Evans¹⁰ showed that a certain percentage of CO_2 was necessary for efficiency of the vasomotor centre, apart from any question of the action of the respiratory centre; this factor was said to play an important part in the difficulties encountered in the attempt to climb Mount Everest. With regard to the observation of Yandell Henderson mentioned above, Haldane adds: "This important experiment shows that when the CO_2 pressure is reduced below a certain point in the respiratory centre, the latter ceases to respond to even the extremest stimulus of want of oxygen."² It is apparently the sudden withdrawal of CO_2 from the alveolar air and blood, and the consequent inactivity of a respiratory centre temporarily set to respond to a less alkaline blood reaction caused by the high percentage of CO_2 , that leads to danger in tracheotomy. The problem was elucidated by Prof. McDowall, and in conjunction with him and Dr. R. D. Lawrence I hope to make further investigations of the cause of this occasional unfortunate occurrence, and the means of avoiding danger in such cases. It is sufficient to mention at present that the line of preventive treatment is directed to gradual lowering of the CO_2 percentage of the blood, either by injections into the blood itself or by the addition of CO_2 to the inspired air.

In the absence of complete data, however, the observations outlined are not intended to represent final conclusions.

Effect of Tracheotomy and Total Laryngectomy.

When the regulating mechanism of the glottis is thrown out of action many alterations affect the economy of the individual, and may take the subjective form of depression and an inability for exertion; in some patients the scene is terminated by suicide. Warming the inspired air is not sufficient to combat these ill-effects, and therefore other causes must be sought for. It would be surprising if total abolition of whatever influence is exerted by the respiratory movements of the glottis should be unattended by serious effects, and therefore it will not appear strange if the main factor at work can be traced to removal of the glottic valve from its controlling position. After opening of the trachea the same total volume of air enters and leaves the lungs during each minute if the activities of the body are maintained at the same level as before the operation.

But the lungs are filled more rapidly and emptied more rapidly than before the operation, because the delaying action of the obstructive glottis has been removed from the path of the air-stream. Consequently, the Hering-Breuer reflex is more rapid in onset than before, and rate of breathing appears to be faster than in the healthy individual. The actual rate observed on 274 occasions in 12 subjects of tracheotomy was on the average 22.83. In one patient after the operation—because of double abductor paralysis—the average rate was 27.8, while the average pulse-rate was 68.4. If more respirations are taken each minute, then each one must be shallower than is normal; that is to say, the tidal volume of air at each respiration is diminished.

These alterations in the mode of air entry are of great importance in the question of removal of CO_2

from the blood. At the beginning of inspiration in the tracheotomy patients a considerable volume of air enters the lungs suddenly and lowers the percentage of CO_2 in the alveoli; consequently, a large volume of CO_2 is washed out of the blood during this period. But there has not been the usual fall in pressure within the pulmonary and pleuro-pericardial cavities, because air entry is so free that it can keep pace with the expansion of the thoracic walls, and can fill the increasing space as soon as it is created. There is still, of course, a certain diminution in intrathoracic pressure because of the influence exerted by elasticity of the lungs; but the total effect on blood-flow through the lungs is definitely less than when the glottis is in action. Consequently, the sudden dilution of alveolar CO_2 is not associated with any marked increase in the volume of blood flowing through the lungs. As this volume of blood is less than during normal inspiration, and as much CO_2 is washed out of it, therefore the CO_2 content of the arterial blood will be less at the beginning of inspiration than during health.

Towards the end of inspiration the flow of blood through the lungs increases, but the washing out of CO_2 does not increase. As a result the CO_2 content of arterial blood rises, and some blood passes through to the systemic circulation insufficiently depleted of the gas.

At the beginning of expiration the tidal air escapes rapidly from the lungs; but there is not the usual increase in intrapulmonary and intrathoracic pressures, because of the absence of obstruction at the glottis. Therefore the blood-stream continues to be of a greater volume than is normal. And as the alveoli have lost their tidal air early, they are gradually accumulating CO_2 until the percentage of the gas rises above the usual level. When this happens the percentage of CO_2 in the arterial blood must also rise because the one follows the other. As a result the CO_2 content of blood leaving the lungs on its way to the tissues continues to rise during expiration; at the beginning of inspiration it will suddenly drop again, as already pointed out.

To sum up: The CO_2 percentage in the alveoli falls suddenly at the beginning of inspiration, and rises considerably towards the end of expiration, while the volume of blood flowing through the lungs rises but slightly during inspiration and is decreased to a less degree than is normal during expiration. The result is that the CO_2 content of the blood supplied to the tissues is lower than normal at the beginning of inspiration and rises towards the end of inspiration and more so still during expiration. There is relative retention of CO_2 , which leads to breathlessness, in the same manner as in pneumonia. The changes described will not affect oxygenation of the blood, because the haemoglobin will be almost saturated, provided there is a sufficient supply of oxygen in the alveolar reservoir.

The supply in the alveoli will be adequate as long as a volume of tidal air arrives at each inspiration sufficient to replace the oxygen which has been taken up by the blood. After opening of the trachea the mechanism will be efficient for this purpose at ordinary times; it is immaterial whether the alveolar oxygen is replaced in jerks instead of in a steady and prolonged stream as in the normal individual. It is possible that upset of distribution of air through the alveoli is another factor dependent on absence of obstruction at the glottis during expiration. Furthermore, the mechanism of air mixing referred to must be obliterated to a certain degree. If contraction of the bronchioles is able to expel air easily through the trachea, there will be an absence of blow-back; replacement of oxygen and removal of CO_2 will then depend on diffusion to a greater degree than is usual. As an incident it will be found that the respiratory waves in the aortic blood pressure are distinctly less marked than in the healthy subject; the mean blood pressure need not, however, show any divergence from that usually seen, because of the many factors capable of compensating for the altered mechanism of respiration.

It will be understood, when these disorganisations of a marvellously delicate mechanism are recognised, why certain individuals cannot tolerate life with an open trachea, and prefer the escape of suicide. But there is no reason why the pulmonary air tract should not be fitted with an automatic valve capable of reproducing the movements of the glottis, and of re-establishing "sympathetic connexion" between respiration and circulation; such a valve is in course of construction.

Results of Nerve Anastomosis.

The working of the respiratory centre has been elucidated by Lumsden,⁸ who describes the normal mechanism as due to periodical rhythmical inhibition of inspiratory tonus. When this inspiratory tonus is inhibited expiration takes place chiefly as a passive act; the latter phase can, however, be actively stimulated from a special centre. Afferent impulses travel up the vagus to the respiratory centre and determine the timing of the phases of respiration. The stimulus for these impulses has been referred to distension or emptying of the lungs, but is thought by Lumsden to be due during easy breathing to passage of air into and out of the lungs.⁸ The respiratory centre during the inspiratory period sends stimuli to various muscles, and at the same time it causes the glottis to open because of certain impulses carried by the recurrent laryngeal nerves. The degree of opening of the glottis is determined by the relation of contraction of the dilator group of muscles to that of the sphincteric group. Both sets are in contraction, but during inspiration the action of the abductors is much more powerful than is that of the adductors. The glottis opens before inspiratory movement of the diaphragm commences, and closes before expiration begins, according to observations made on cats by McDowall and myself. Therefore contraction of laryngeal and diaphragmatic muscles is not synchronous.

The factors at work in determining the position of the vocal cords have been described by various authors, notably by Semon.⁴ If a stimulus be sent along the recurrent laryngeal nerve as a whole, the glottis closes, because the action of the adductors is more powerful than is that of the abductors. Therefore the stimulus during normal inspiration, which causes the glottis to be held open, must be a selective one, and directed more powerfully to the dilator muscles than to the adductors. After anastomosis of the recurrent nerve in certain paralytic conditions, either to the descendens hypoglossi,^{11 12} or to the phrenic,¹² movement of the affected cord may recommence. As there is in these cases a selective stimulus directed to the abductors, it is probable that impulses must originate from different parts of the nucleus of the nerve employed for anastomosis, and stimuli must be supplied to this particular part of the nucleus from the respiratory centre. The phrenic nerve, for instance, must send powerful stimuli to the diaphragm during inspiration, and only feeble ones or none at all during expiration, because this muscle is active only during the former phase, and is passively relaxed during the latter. Therefore it may be supposed that if part of the phrenic be anastomosed to the recurrent laryngeal nerve, and if the nerve were to carry stimuli of the same character as before, there would be impulses sent along all the fibres of the recurrent nerve during inspiration, impulses intended to reach the diaphragm.

It must be remembered that there is no primitive connexion between the larynx and diaphragm. The former is present, and shows definite respiratory movements at the glottis, in many animals in which the latter is absent, as, for instance, in amphibians and reptiles. Any general stimulation would cause closure of the glottis, because of the superior power of the adductors as compared with the abductors. It has been shown that the fibres serving the abductors travel together in a bundle distinct from those going to the adductors¹³; the two groups can be separated in the vagus, and must obviously originate from distinct

groups of nerve cells. After anastomosis the abductor fibres must be replaced by a bundle of phrenic fibres in a corresponding position; these must originate from a distinct group of cells. Consequently, it is to be supposed, in view of the fact that abduction of the cords occurs during inspiration, that this new group of cells from which the abductor fibres originate receives a selective stimulus from the respiratory centre, or else that the group supplying the adductors is inhibited, thus allowing tonic impulses to bring about opening of the glottis because of the unopposed action of the abductors.

The results obtained by Ballance and Colledge and others appear to be remarkably successful when these aspects of the subject are considered. But even when this extraordinary selective result has been attained success is not perfect unless the glottic aperture is enlarged to the requisite degree in accordance with the immediate needs of respiration. Wide opening on gentle breathing, or slight opening in forced respiration does not fulfil the conditions necessary for the delicate mechanism described. Although the result is admirable for ordinary purposes and allows of successful respiration and phonation, yet the fine adjustment is lost. If the opening is too big the conditions resemble those described in the case of tracheotomy; while if it is too small then a certain degree of laryngeal obstruction is present, with its varied effects. There is, in brief, a loss of that "sympathetic connexion" referred to by John Hunter, whose brilliant example has supplied the incentive for this attempt at elucidation of certain aspects of a somewhat complex problem.

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THE LATE DR. J. F. S. HAY.—Joseph Frank Strong Hay, M.B., C.M. Aberd., Inspector-General of the New Zealand Mental Hospitals, died on Sept. 5th at sea, while returning to New Zealand after a visit to England. Dr. Hay graduated in medicine at Aberdeen University in 1890, and shortly after became assistant medical officer at James Murray's Royal Asylum, Perth, Scotland. He was then appointed to the post of physician-superintendent at the Ashburn Hall Asylum, Dunedin, New Zealand, and subsequently became Inspector-General of Mental Hospitals and Prisons in that country.

ON IMMUNITY TO THE TOXIN OF
STREPTOCOCCUS SCARLATINÆ.

A Report to the Medical Research Council.

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AND

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PART I.

A MEASUREMENT OF IMMUNITY AS DETERMINED IN
CHILDREN AND IN ADULTS BY THE INTRADERMAL
TITRATION OF MULTIPLE DOSES OF TOXIN.

At present there is not available an in-vitro test or an animal test by which the toxin of *Streptococcus scarlatinae* can be measured, so that for purposes of titration recourse must be had to the skin test on human beings. It may be assumed that a strong Dick toxin will give a positive reaction with the majority of individuals, while the same toxin can be diluted so far that it yields no positive reactors at all. It is only at some intermediate point between these two extremes that a dilution will be found that gives the most successful differentiation between susceptibles and immunes. Theoretically, the best dilution to use is that which gives the greatest number of negative reactions when tested on convalescents, and which, conversely, will also disclose the largest number of positive reactors among susceptible individuals. But to determine this dilution is a problem of much difficulty, nor does it help matters to define it as a dilution of a certain strength, for such a statement gives no measure of its valency. It is a common experience that toxins prepared from the same strain of organism under experimental conditions which seem to be constant give wide variations in potency, so that a 1 in 50 dilution of one toxin may be equivalent to a 1 in 5000 dilution of another.

It follows, therefore, that until such time as the toxins used for a Dick test can be effectively standardised against an antitoxin constant and expressed in terms of this constant, it is premature to group individuals into positive or negative reactors, particularly as it has become customary to base this differentiation on the result of one solitary skin test. Until we have information regarding the effect of both higher and lower dilutions of the same toxin on the same group of individuals, we are unlikely to attain to a true interpretation of our results.

The experiments detailed in this report were undertaken with different dilutions of the same toxin, each individual receiving two, three, or four skin test doses together with a heated control. The toxin used is an 8-volume alcohol precipitated toxin. The smallest amount employed for a skin test dose is represented by 0.00015 mg. of the precipitated product, and from this starting point we have proceeded, by multiples of two, through a series of dilutions to a maximum skin test dose of 16 times the smallest—viz., 0.0024 mg. For descriptive purposes we propose to call the minimum dose one unit, so that the series of experiments we shall describe was undertaken with 1, 2, 4, 8, and 16 units.

Thus it has become possible to grade the individuals who have been tested into what may be termed "immunity groups," and also to determine how much excess of toxin is capable of breaking down resistance in such a way as to transfer a negative reactor into the group of positive reactors.

The most resistant group that comes within the ambit of our observations is composed of individuals who give no reaction with 16 units, while the most sensitive group is made up of individuals who react positively to one unit. The skin reactions of these extreme groups and of the intermediate groups are set forth diagrammatically in Table I.

TABLE I.

The classification of individuals into "immunity groups" according to their reactions to the toxin of *Streptococcus scarlatinae*.

Group.	Toxin units.					Group.	Toxin units.				
	16	8	4	2	1		16	8	4	2	1
I. ..	—	—	—	—	—	IV. ..	+	+	+	—	—
II. ..	+	—	—	—	—	V. ..	+	+	+	+	—
III. ..	+	+	—	—	—	VI. ..	+	+	+	+	+

In our previous report¹ dealing with the preparation and precipitation of the toxin of *Streptococcus scarlatinae* we divided individuals into positive and negative reactors, taking as positive reactions such as reached a diameter of 1 cm. or more, and classifying as negative all those of lesser extent. It soon became obvious to us, however, that although some slight reactions might be attributable to trauma yet many were actually positive, and therefore could not be legitimately classified as negative. With further experience it became possible for us to distinguish the reaction or disturbance due to trauma from the slightly positive reaction, and this latter we have designated by the symbols $\pm$. The validity of establishing such an intermediate group between positive and negative reactors becomes apparent from a scrutiny of our figures, for with the two- or three-dose method of titration which we have employed it becomes possible to discern how, with increase in dosage, negative reactors are gradually transferred into positive reactors by passage through the intermediate $\pm$ zone.

There is also another type of reaction to which we would wish to draw attention. The Dick reaction as it occurs in susceptible folk is of a bright scarlet or pink colour, which to the experienced is unmistakable. In certain scarlet fever convalescents, and occasionally also in individuals who have not suffered from the disease, the reaction may be equal in area to a positive reaction, but it is either colourless or very faintly pink. Its presence may be detected only from the fact that it possesses a well-defined though very narrow pink edging or margin, which may be easily missed unless the examination be carried out in good daylight. From its appearance we would designate this as the "ghost" reaction, and we have classified it with the $\pm$ reactions.

(A) Titration in Children.

EXP. 1.—This was carried out with 1 and 2 units and was in the nature of a preliminary titration. Twenty children 14 of whom were from 2 to 5 years and six from 5 to 10 years of age, were tested intradermally. In none of these children as far as could be ascertained was there any history of scarlet fever. At the same time the same amounts of toxin were given to 20 adult females, hospital sisters and nurses, many of whom had had long contact with scarlet fever cases. These groups of individuals were chosen on the assumption that they were likely to represent extremes in so far as immunity to the toxin was concerned. The results, expressed in Table II., showed that although the amounts of toxin used gave good reactions in susceptible children, yet the doses employed did not disclose a single positive reactor among the adults.

TABLE II.

A two-dose experiment to show the differentiation between susceptible children and adult females.

	Toxin units.					
	1			2		
	+	$\pm$	—	+	$\pm$	—
Children (20) 2-10 years ..	12	2	6	12	4	4
Adult females (20) ..	0	1	19	0	6	14

EXP. 2.—In this experiment 2 and 4 units of toxin were used, the test being carried out on 25 non-scarlet children

¹ Henry, H., Lewis, F. C., and Others: On the Toxin of *Streptococcus scarlatinae*, THE LANCET, April 4th, 1925, p. 710.

and on 50 children convalescent from scarlet fever. The age-groups of these children were as follows:—

Years—	2-5	5-10	10-15
Non-scarlet ..	20	5	10
Scarlet ..	13	27	10

The scarlet children were grouped according to their period of convalescence thus:—

Days—	0-10	10-20	20-30	30
Scarlet ..	0	3	7	40

The results (Table III.) show that with 2 units there is a marked preponderance of positive reactors among non-scarlet children and that the majority of scarlet convalescent children are resistant to the same dose.

TABLE III.

A two-dose experiment in selected children to show differentiation of normal from scarlet fever convalescent children.

Children.	Toxin units.					
	2			4		
Non-scarlet (25) ..	16	6	3	20	3	2
Scarlet (50) ..	2	7	41	10	12	23

EXP. 3.—This was a three-dose titration carried out with 2, 4, and 8 units on 100 scarlet fever convalescents and on 100 non-scarlet individuals. Each series shows approximately 10 per cent. of adults, the remainder being children who, when classified according to their age, present two groups that are as closely parallel as is practically possible. The age-groups of both series and the period of convalescence in the case of scarlet fever individuals are as follows:—

Age-groups—	2-5	5-10	10-15	Adult
Non-scarlet (100) ..	40	32	19	9
Scarlet (100) ..	25	45	19	11
Convalescence in days—	0-10	10-20	20-30	30 on
Scarlet ..	5	22	24	49

The readings of this titration are set out in Table IV.

TABLE IV.

A three-dose experiment to show differentiation between non-scarlet children and scarlet fever convalescent children, as representing an average fever hospital population.

	Toxin units.					
	2			4		
Non-scarlet (100) ..	53	7	40	55	13	32
Scarlet (100) ..	9	11	80	17	11	72

EXP. 4. A Collection of "Throw-outs."—In Exps. 2 and 3 we have dealt with two well-defined series of individuals. One of these series was made up of individuals who had passed through an attack of scarlet fever, while the other series comprised those who had passed through an attack of diphtheria. From the first series we have been careful to exclude those cases in which there was, on clinical grounds, doubt in regard to the diagnosis of scarlet fever and these we have grouped under the term "doubtful diagnosis." At the same time, there were found in the diphtheria wards a number of children in which there was a clear history of a previous attack of scarlet fever. These we have excluded from the non-scarlet cases and classified here as "old scarlets." The age-groups of these individuals are as follows:—

Age-groups—	2-5	5-10	10-15	Adult
Doubtful diagnosis (23) ..	3	12	5	3
Old scarlets (22) ..	2	14	5	—

The three-dose titration of these groups is given in Table V.

TABLE V.

A three-dose experiment in cases of doubtful diagnosis and in cases in which there is definite evidence of a previous attack of scarlet fever.

	Toxin units.					
	2			4		
Doubtful diagnosis (23) ..	10	4	9	16	3	4
Old scarlets (22) ..	1	0	21	1	0	21

EXP. 5. Determination of End-points in the Scale of Titration.—The figures which result from the titrations grouped together in Exp. 3 show the number of positive and negative reactions to 2, 4, and 8 units of toxin in two series of individuals, composed respectively of scarlet and of non-scarlet children of comparable age. There still remains for determination the number of positive reactors at the extreme limits of our scale—viz., with 1 unit and with 16 units. Ten scarlet fever convalescents who proved

to be negative to 8 units were tested intradermally with 16 units, and of these five proved to be positive. No similar figures are available for non-scarlet children, but it may be assumed that in this case the number of positive reactors to 16 units is as before—viz., about half the number that is negative to 8 units. The 16-unit results are not easy to read, because here for the first time we found ourselves faced with the difficulty of pseudo-reactions. At the other end of the scale—viz., in experiments with 1 unit—it was found that out of 24 non-scarlet children who were positive to 2 units, 13 proved to be still positive to 1 unit. No figures are available in respect of scarlet convalescents, and here again we have assumed the number of positive reactors to 1 unit to be approximately half the number of those who are positive to 2 units. At this end of the scale also it is difficult to arrive at an accurate estimate, because the reactions are both slight in intensity and fugitive in character.

(B) Titration in Adults.

EXP. 6.—A three-dose test with 2, 4, and 8 units was carried out on 120 adult females and on 110 adult males, the result of the titration being set forth in Table VI. Of ten adult females who were resistant to the 8-unit dose, five proved to be still resistant to 16 units. In the case of the adult males no figures are available. Also, at the other end of the scale, in regard to the 1-unit dose no figures are available either in respect of adult males or of adult females. A reference to the graph shows that immunity is at a higher level in the females we tested than in the males.

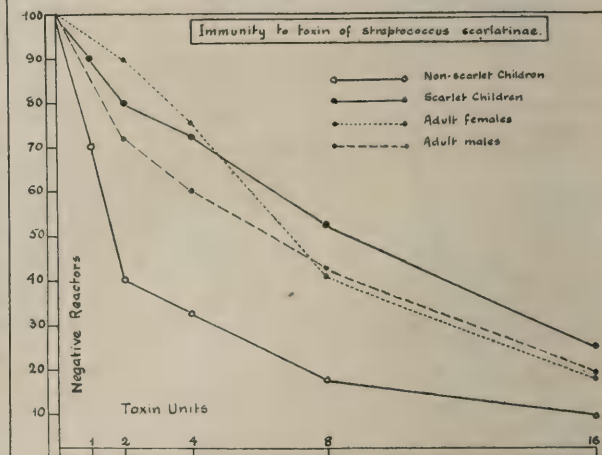
TABLE VI.

A three-dose titration in adults.

	Toxin units.					
	2			4		
Adult females (120) ..	4	9	107	12	16	92
Adult males (110) ..	25	5	80	31	12	67

Discussion.

Exps. 1 and 2 were undertaken with a view to determining how effective our toxin is in disclosing a differentiation between susceptibles and immunes. In each case there was a selection of individuals



that resulted in an accentuation of this capacity for differentiation. The susceptible individuals were the most susceptible that could be found, and the resistant individuals were, on similar presumptive grounds, those whom we decided were likely to show the highest immunity. Therefore the differentiation between susceptible and resistant people is in each of these experiments at an exaggerated maximum.

On the other hand, the individuals grouped in Exp. 3 were not selected, and so represent better an average hospital population. From the figures obtained in Exp. 3 we have constructed a graph showing the degree of immunity of both scarlet and non-scarlet children at each point on our scale of titration. It is to be noted that the maximum amount of differentiation according to our experimental data is not at one particular point of the scale, but extends over a relatively large range of doses. With 2, 4

and 8 units it is practically 40, and it is perhaps of interest to note that the maximum percentage differentiation as given by the Dicks for one skin test dose is 41.6.

On reference to the theoretical definition of a skin test dose as propounded in the introduction to this Report it will be found that the 2 unit dose agrees more closely with this definition than any other, inasmuch as it gives the minimal number of positive reactors in scarlet fever convalescents. Yet the American skin test dose differs from our 2 unit dose in one very important particular, in that it discloses only negative or faintly positive reactors among scarlet fever convalescents, whereas the 2 unit dose gives positive reactions in 20 per cent. of convalescents. Most of these reactions are strongly positive, so that a difference of interpretation of readings does not account for the existence of this difference between our findings and those of American workers.

In seeking to discover what these positive reactors mean we would venture to suggest that the following considerations might be borne in mind. 1. They may be cases of mistaken diagnosis, a possibility which cannot be excluded. 2. They may be cases of scarlet fever which do not for some reason develop an immunity. It is to be noted that more than half these cases suffer from complications such as otitis, myocarditis, &c. 3. They may be cases which resemble scarlet fever so closely as to be clinically indistinguishable from it, in much the same way that paratyphoid resembles typhoid. In the present state of our information it is not possible to assign to each of these three considerations its proper measure of importance. We think it probable that no one of them can be altogether excluded.

There still remains to consider the question of the degree of immunity as shown by adults and by scarlet fever convalescents. To the graph which interprets Exp. 3 we have added our findings in regard to adult immunity. The majority of the females were hospital staff who were constantly coming into contact with scarlet fever, while the adult males were taken at random. Yet, except for an increased immunity in the females, there is but little difference between the two curves. Also we find that the level of immunity to which adults reach is practically the same as that attained by convalescent children. Of the males only 9 per cent. and of the females 20 per cent. gave a previous history of scarlet fever, so that the majority of the adults, both female and male, have acquired immunity without passing through a disease which is clinically recognisable as scarlet fever. Also, at first sight the degree of immunity reached by convalescent children would seem to be relatively low. Is this because the type of scarlet fever is at present mild in character, or is it because the peak of antitoxin production is reached only after months rather than weeks of convalescence?

PART II.

AN EXPRESSION OF INDIVIDUAL RESISTANCE IN TERMS OF ANTITOXIN CONTENT.

In the first part of this Report we have sought to classify individuals into a series of "immunity groups" according to their resistance to increasing doses of the toxin of *Streptococcus scarlatinae*. Our findings showed that throughout any collection of individuals the resistance varied over a wide range. At one end of the scale of immunity could be grouped the majority of small children in that they proved to be sensitive to a small dose of toxin, whereas the bulk of convalescent scarlet fever children and the majority of adults either male or female were resistant to this dose. Further, by testing with multiples of this small dose it became possible to obtain a collection of folk who were highly resistant to the toxin in that they did not react to these higher doses.

It remained, however, to discover whether this resistance, as determined by a skin test, could be measured in any other way. The brief series of experiments detailed in this report shows that indi-

vidual resistance to the skin test is correlated with the presence of antitoxin in the blood of the individual. The sera which have been proved to contain antitoxin were taken from individuals in Groups I. and II. of the "immunity groups" already mentioned. At the same time we have examined serum obtained from individuals in Groups V. and VI., and in these we have not detected any antitoxin which is measurable by the titration method employed.

Method of Titration.

The method has consisted in the mixing of a fixed amount of toxin with decreasing amounts of serum, the mixtures being incubated for one hour at 38° C. before inoculation. For example, if 50 units of toxin in 0.5 c.cm. of saline are mixed with 0.5 c.cm. of undiluted serum, and if 0.2 c.cm. of the mixture be used for the skin test, then the inoculum consists of 10 units of toxin and 0.1 c.cm. of serum.

For the testing of toxin-antitoxin mixtures individuals who are susceptible to 1 or 2 units have to be selected, because they react the most readily to any unneutralised toxin there may be in the mixture and so give a more exact end-point. The amount of toxin used in each individual dose of a toxin-antitoxin mixture is a matter for experiment. We have found that 4 units gives an end-point that is too indistinct, and that 20 units gives an end-point which occurs too suddenly, and which may occasion too large an area of skin reaction. A dose of 10 units has been selected, therefore, as being a practicable amount.

Interpretation of Readings.

The fact that these toxin-antitoxin mixtures are capable of dissociation after inoculation presents a problem which may add considerable difficulty in regard to the reading of an end-point. The phenomenon may be best explained perhaps by the description of an actual example. A human serum containing antitoxin was titrated against 10 units of toxin, the amounts of serum present in each skin test dose of the series being 0.1, 0.04, 0.02, 0.01, 0.004, 0.002, 0.001, 0.0004 c.cm. The reactions in the case of the first three doses were 0.25 to 0.5 cm. in diameter at 24 hours, and at 48 hours were faint and indistinct. In the case of the next three doses in the series the 24-hour readings gave areas of varying size from 1 to 2 cm. in diameter, whereas at 48 hours each of these areas had greatly increased by the formation of an areola, the total zone of skin affected being 3 cm. or more in diameter. In the case of the last two doses the reactions, of 2 to 3 cm. in diameter, were fully developed at 24 hours and had begun to fade at 48 hours. There are thus three zones of reactions to be read after the intradermal titration of a toxin-antitoxin mixture—a zone of complete neutralisation, a zone of dissociation and presumably of partial neutralisation, and a zone of no apparent dissociation with neutralisation at a minimum.

The problem of dissociation is not one that can be dealt with here, and we propose to discuss it more fully in a future Report, particularly as it has a distinctly practical bearing on the immunisation of individuals with toxin-antitoxin mixtures.

The end-point in the scale of titration which we have selected is the point at which occurs a reaction of 1 cm. or less in 24 hours. Each serum dealt with in this Report has been titrated on two or more individuals, the value given in each instance being the number of toxin units neutralised by 1.0 c.cm. of serum.

EXP. 7.—This was carried out with four sera taken from individuals who were strongly sensitive to toxin: Serum A, adult female, sensitive to 1 unit, giving no history of scarlet fever; B, child, aged 5 years, sensitive to 2 units, having no history of scarlet fever; C, child, aged 5 years, "doubtful diagnosis," sensitive to 2 units; D, adult female, aged 19 years, diagnosed as surgical scarlet fever, highly sensitive to 2 units. The results, set forth in Table VII., show that there is no neutralisation of 10 units of toxin even with 0.1 c.cm. of serum, and that if antitoxin is present it cannot be measured in the scale of titration used. The absence of dissociation in the case of serum A we are inclined to

consider as indicating complete, or almost complete, absence of antitoxin, while its presence in sera B, C, and D indicates small quantities of antitoxin. Each of these sera, therefore, contains less than 100 units.

TABLE VII.

Four sera taken from individuals who are sensitive to small doses of toxin and titrated against 10 units of toxin. In all cases the reactions were more than 1 c.cm. in diameter.

Serum.	Test.	Serum—amounts in c.cm.			Serum.	Test.	Serum—amounts in c.cm.		
		0.01	0.04	0.02			0.01	0.04	0.02
A	1	+	+	+	C	1	+	+	+
	2	+	+	+		2	+	+	+
	3	+	+	+					
B	1	+	+	+	D	1	+	+	+
	2	+	+	+		2	+	+	+
	3	+	+	+					

EXP. 8.—Two sera taken from Group I. individuals and two taken from Group II. individuals were used in this experiment: Serum A, adult female with history of scarlet fever in infancy; B, a convalescent scarlet fever child; C and D, adult female with no history of scarlet fever. The results, set out in Table VIII., show that each of these sera contains a measurable amount of antitoxin. In the case of the Group I. sera it amounts to 500 units, while in the others it amounts to about 400 and 250 units respectively.

TABLE VIII.

Four sera taken from resistant individuals and titrated against 10 units of toxin.

Serum.	Test.	Serum—amounts in c.cm.					Serum.	Test.	Serum—amounts in c.cm.				
		0.1	0.04	0.02	0.01	0.004			0.1	0.04	0.02	0.01	0.004
A	1	—	—	—	+	+	C	1	—	—	—	+	+
	2	—	—	—	+	+		2	—	—	—	+	+
	3	—	—	—	+	+		3	—	—	—	+	+
	4	—	—	—	+	+							
	5	—	—	—	+	+							
	6	—	—	—	+	+							
B	1	—	—	—	+	+	D	1	—	—	+		
	2	—	—	—	+	+		2	—	—	+		

Summary.

The sera of individuals who are sensitive to small doses of toxin contain little or no antitoxin. On the other hand, the sera of resistant individuals contain a measurable quantity of antitoxin, amounting to as much as 500 units. That this amount is considerable may be judged from the fact that the best of a series of horse antitoxic sera, the first to be produced in this country, titrated against 20 units of toxin, have given a unitage of about 800 on the same scale. The exact relationship of resistance to antitoxin content is a matter for further experiment.

There are peculiar difficulties which are inherent to an investigation of this nature. Fortunately we have had the encouraging help of the public health committee of the Birmingham City Council, and it gives us pleasure to record our appreciation of the facilities they have given us in affording access to clinical material in the City Fever Hospitals and of the practical and friendly interest they have taken in the progress of the work. The majority of the reactions herein detailed were carried out by ourselves, and for most of the remainder we have to thank Dr. E. H. R. Harries and his medical officers. We gladly express our thanks, too, to Dr. R. H. H. Jolly and Dr. B. C. Haller, of Wolverhampton, together with Dr. J. B. Ferguson and Dr. R. Sandilands, of Smethwick, who generously placed at our disposal the available material in the respective hospitals over which they have control. We also wish to thank the President and members of the Birmingham Rotary Club for assisting us in obtaining the necessary number of adult volunteers for test.

THE GEOGRAPHICAL DISTRIBUTION OF HEART DISEASE IN ENGLAND AND WALES

AND ITS RELATION TO THAT OF ACUTE RHEUMATISM AND TO SOME OTHER FACTORS.

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(From the National Institute for Medical Research.)

THE annual mortality from heart disease in England and Wales comprises a relatively large proportion, approximately 12 per cent. on the average, of the mortality from all causes. It seemed to be of interest to determine from recent data if the mortality from this cause showed any notable variation in different parts of the country, if the districts with high and low rates of mortality were distributed in any special manner, and if the geographical distribution of heart disease had any relationship to that of acute rheumatism which so frequently precedes it, or any association with special physical features, or industrial or environmental conditions.

The data that were used were the recorded deaths, at the different ages, from heart disease in the administrative counties and county boroughs of England and Wales published by the Registrar-General in his annual reports. Two groups of data were taken: (1) The deaths from organic heart disease in the four years' period 1911-14, and (2) the deaths from heart diseases in the three years' period 1921-23. Included in the term "organic heart disease," as defined by the Registrar-General, are valvular disease of the heart, fatty degeneration of the heart, and other organic diseases of the heart. The data for the three years' period consist of heart diseases in the aggregate and include, in addition to organic heart disease, pericarditis, acute endocarditis, acute myocarditis, and angina pectoris. These other diseases only comprise, however, as shown by the data for the three years' period 1921-23, approximately 6.5 per cent., and, excluding angina pectoris, 4 per cent. of the total deaths from heart disease on the average. Amongst the recorded deaths from heart disease in the same triennial period, 44 per cent. are described definitely as valvular disease, a further 20 per cent. are given as "heart disease undefined," which is probably also to some extent valvular disease; well over 50 per cent. of the registered mortality from heart disease may thus probably be attributed to valvular affections.

From the published data for deaths from heart disease in urban and rural districts in the administrative counties and the associated county boroughs, figures were compiled for the areas corresponding approximately, but not accurately, to registration counties, and for each of these standardised death-rates from heart disease for the sexes separately, and for persons from 25 years of age and upwards and from 45 years and upwards respectively were calculated. These standardised death-rates for the different areas, which may be referred to briefly as county areas, were used as an index of the mortality therein. In England and Wales data were available for 55 counties altogether.

The standardised death-rates from heart disease amongst persons from age 25 and upwards were inserted in a map of England and Wales (see figure) showing the counties, and the distribution of the rates obtained from the data for the two periods, 1911-14 and 1921-23, was in general very similar and very characteristic. The death-rates for the earlier period are shown in Table I., and the distribution of these rates, classified in six different grades of magnitude, is shown in the accompanying map. The highest rates, with few exceptions, are found localised in the northern and western areas of the country; in the counties of Wales particularly, the rates are generally above the average for England and Wales as a whole. The

counties of Radnor and Westmorland are notable amongst the exceptions to this generalisation. The rate in Westmorland, however, is practically the average for the whole country, and in the later period it exceeds the average. It should be recollected also that in both these counties the number of deaths and the total population are relatively small, and consequently the death-rates have a larger probable error than in many of the other counties. In the eastern, south-eastern, and midland counties of England, however, the mortality-rates are lower than in the counties farther west, and definitely below the average as a rule. The incidence of the relative mortality thus shown is very divergent from that described by Haviland (1875) as existing for the mortality-rates for heart disease and dropsy in the decennium 1851-60. Haviland's conclusion, as a result of his investigation, was that the counties in which the mortality from heart disease is greatest are those that are the most inland or the most protected by their physical surroundings, and that there is a progressive increase of mortality from the circumference of our peninsula towards its more central localities. Whereas Haviland found, as he illustrates in his maps, the lowest mortality to occur in the counties farthest west—namely, the coastal counties of Wales, in the present data the highest incidence of mortality is localised there. The discrepancy may be explained in part by Haviland's use of crude mortality rates for the earlier period, but the distribution of relative mortality in the two periods, 1851-60 and 1911-14, is so completely at variance that it seems unlikely that this can be an adequate explanation. Possibly some change in the relative incidence in different districts may have taken place in the interval that has elapsed between the two epochs. It is readily apparent from the map that the lowest mortality in the present data is not coincident with or closely related to the greatest exposure to prevailing winds or sea air, or the highest mortality characteristic of districts that are protected by their physical features, as suggested by Haviland, and that other factors that determine the distribution must be in operation.

Association between Relative Mortalities from Heart Disease and Acute Rheumatism.

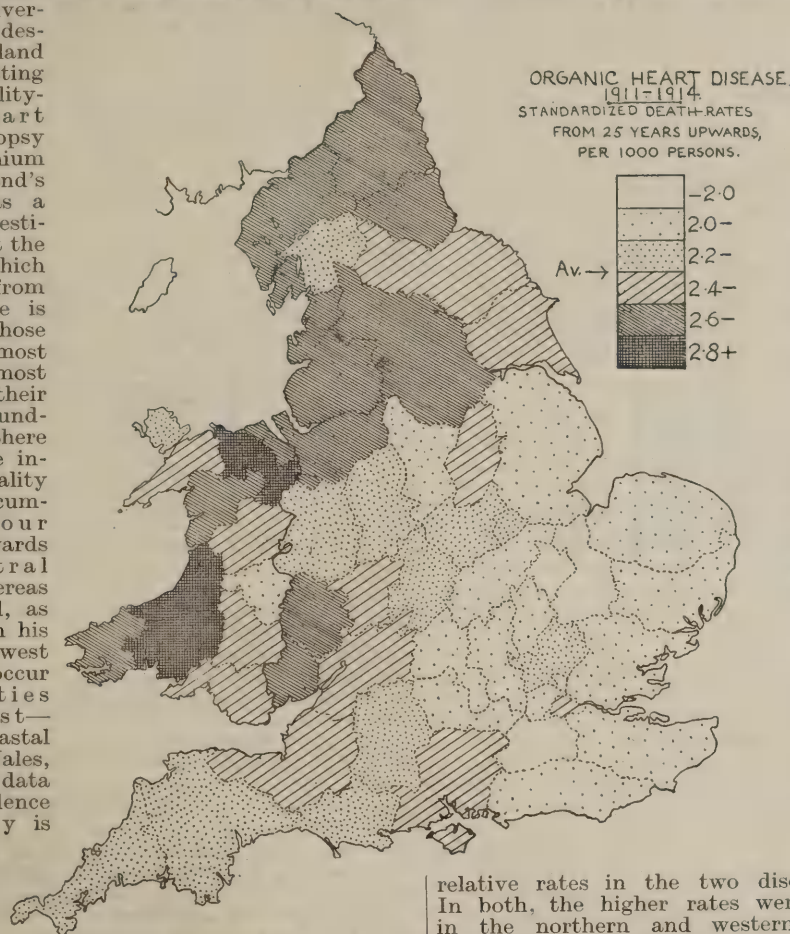
The question then arises, is there any correspondence in the county areas between the distribution of the relative mortalities from heart disease and acute rheumatism? In a previous paper (1921) on the epidemiology of rheumatic fever, the distribution of the mortality from rheumatic fever in the registration

counties of England and Wales, as shown by the standardised death-rates from age 15 upwards, is given for the decennium 1901-10. This analysis seemed to show that an excessive incidence of the disease in the counties had some definite relation to excessive amounts of rainfall and cold weather. Though the standardised death-rate from rheumatic fever can only be regarded as an approximate measure of the actual incidence of the disease in the respective counties, it is the only criterion that is available at present. The use of the mortality-rates as an index of the prevalence of the disease in different districts receives some support as regards the northern, western,

and eastern counties of England from some data recently published in an analysis of the incidence of rheumatic fever amongst insured persons in England and Wales in 1922 by the Rheumatism Committee of the Ministry of Health. An excess of acute, including subacute, rheumatism over what might be expected was found in the north-western and north-eastern divisions, whereas the south-eastern division showed a pronounced shortage as compared with what might be expected.

On comparing the two maps of England and Wales that had been prepared to show the mortality-rates from rheumatic fever and from heart disease in the respective counties, evidence of some agreement in the distribution of the

relative rates in the two diseases was apparent. In both, the higher rates were found in general in the northern and western counties; in the eastern counties, as has already been mentioned for heart disease, the rates were considerably lower. The data available made it possible to determine the relationship more precisely. Coefficients of correlation were calculated between the standardised death-rates from rheumatic fever amongst persons aged 15 and upwards in the respective counties in the decennium 1901-10 and the standardised death-rates from organic disease of the heart in the corresponding counties for each of the periods 1911-14 and 1921-23. In the earlier period, the coefficient of correlation between the death-rate from heart disease at age 25 and upwards and acute rheumatism was $+0.590 \pm 0.059$ and that between the death-rate from heart disease at age 45 and upwards and acute rheumatism $+0.573 \pm 0.061$. For the later period the coefficients of correlation between the corresponding variables were $+0.608 \pm 0.057$ at age 25 and upwards and $+0.563 \pm 0.063$ at age 45 and upwards—i.e., practically identical with those for the earlier period. A very definite association thus exists in the counties between the distribution of the relative mortalities from rheumatic fever and diseases of the heart in the aggregate.



The Industrial Factor.

With regard to the distribution of relative mortality from heart disease throughout England and Wales, certain other points require consideration. Amongst the English counties showing the highest mortality-rates from heart disease are the West Riding of Yorkshire, Durham, Northumberland, and Lancashire. These counties possess the common feature that one or two special industries provide occupation for a relatively large proportion of their inhabitants. Thus, in the West Riding, textile, principally wool and worsted, manufacture and coal-mining; in Lancashire textile, principally cotton, manufacture, coal-mining, and working in metals; in Durham and Northumber-

Pembrokeshire, where rates amongst the highest that occur are found, the population is mainly engaged in agricultural pursuits; in Merionethshire also, agriculture provides employment for the largest proportion of the male inhabitants, though many are engaged in slate-mining and quarrying. In slate-quarries and workers the comparative mortality figure for valvular disease of the heart is 37—i.e., practically the average; in agricultural workers and farmers the comparative mortality figures are definitely lower than the average for all occupied males. The circumstance that the highest death-rates from heart disease occur in counties in Wales where no specially adverse industrial conditions exist, such as obtain in the West Riding of Yorkshire and Lancashire, is opposed to the view that

TABLE SHOWING THE STANDARDISED DEATH-RATES FROM ORGANIC DISEASE OF THE HEART IN THE COUNTY AREAS OF ENGLAND AND WALES FOR THE FOUR YEARS' PERIOD 1911-14.

Counties.	S.D.R.'s per 1000 from age 25 upwards*			Counties.	S.D.R.'s per 1000 from age 25 upwards*			Counties.	S.D.R.'s per 1000 from age 25 upwards*		
	M.	F.	P.		M.	F.	P.		M.	F.	P.
Bedford ..	2.129	2.129	2.129	Leicester ..	2.252	2.332	2.342	Worcester ..	2.638	2.339	2.458
Berkshire ..	2.295	2.077	2.181	Lincoln ..	2.204	1.859	2.032	York, E. Riding	2.684	2.198	2.441
Buckingham ..	2.219	1.904	2.062	Middlesex ..	2.261	1.992	2.127	York, N. Riding	2.577	2.527	2.552
Cambridge ..	1.839	1.749	1.794	Monmouth ..	2.503	2.731	2.617	York, W. Riding	2.727	2.763	2.745
Chester ..	2.803	2.563	2.683	Norfolk ..	2.185	1.926	2.056	Anglesey ..	2.423	2.171	2.297
Cornwall ..	2.477	2.171	2.324	Northampton ..	2.100	2.011	2.056	Brecknock ..	2.401	2.602	2.502
Cumberland ..	2.844	2.444	2.644	Northumberland ..	2.718	2.663	2.691	Cardigan ..	2.901	2.786	2.844
Derby ..	2.106	2.273	2.190	Nottingham ..	2.616	2.528	2.572	Carmarthen ..	2.583	3.151	2.867
Devon ..	2.451	2.141	2.296	Oxford ..	2.200	2.089	2.145	Carnarvon ..	2.674	2.374	2.524
Dorset ..	2.313	2.133	2.223	Rutland ..	2.452	2.251	2.352	Denbigh ..	2.666	3.128	2.897
Durham ..	2.717	2.675	2.696	Shropshire ..	2.470	2.261	2.366	Flint ..	2.646	2.551	2.599
Essex ..	2.172	2.042	2.107	Somerset ..	2.990	2.150	2.570	Glamorgan ..	2.621	2.562	2.592
Gloucester ..	2.709	2.336	2.523	Stafford ..	2.263	2.252	2.258	Merioneth ..	2.914	2.319	2.617
Hampshire ..	2.635	2.213	2.424	Suffolk ..	2.092	2.063	2.078	Montgomery ..	2.353	2.542	2.448
Hertford ..	2.696	2.623	2.660	Sussex ..	2.336	2.020	2.178	Pembroke ..	2.756	2.775	2.766
Hertford ..	2.414	1.978	2.196	Surrey ..	2.027	1.708	1.868	Radnor ..	1.897	2.228	2.063
Huntingdon ..	1.786	1.904	1.845	Warwick ..	2.148	2.286	2.217	London ..	2.507	2.344	2.426
Kent ..	2.211	2.058	2.135	Westmorland ..	2.529	2.228	2.379				
Lancaster ..	2.632	2.574	2.603	Wiltshire ..	2.354	2.323	2.339	England and Wales	2.479	2.351	2.415

* The deaths from age 25 upwards exceed 95 per cent. of the total deaths.
M. = Males. F. = Females. P. = Persons.

land, coal-mining, are much the commonest forms of employment for males. It may be suggested that the excessive mortality from heart disease found in these counties has some relationship to the special industries that prevail therein. The influence of occupation in determining the onset of heart strain and valvular disease of the heart has been described by some authors, including Peacock (1865) and Cowan (1922). Fortunately it is possible to obtain some information on this point. In the supplement to the seventy-fifth annual report of the Registrar-General, Part IV., are given particulars of the mortality from valvular disease of the heart in certain occupations in the three years 1910, 1911, and 1912. The comparative mortality figure for valvular disease of the heart for all occupied and retired males in the three years' data is 39. In textile workers as a whole and in those engaged in cotton manufacture, in wool and worsted and in hosiery manufacture, the mortality figures for the disease are practically the average for all males. In the coal-mining industry as a whole the comparative mortality figure for valvular disease of the heart is 37; in coal-miners in Lancashire and in Northumberland and Durham it remains at the same level—i.e., approximately the average for all occupations. In the groups of metal workers the comparative mortality figure for the disease is usually under the mean value. The mortality-rates for valvular disease thus do not seem to be in excess in the occupations which provide the major proportion of the employment in these counties. Further, as has been mentioned already, many counties with relatively high death-rates from heart disease as a whole, including those actually highest, are found in Wales. In Brecknock, Carmarthen, Denbigh, and Glamorgan a relatively large proportion of the male population is employed in the mining industry, but in Cardiganshire and

the excessive prevalence of the disease in the latter can be attributed in any definite degree to occupational influences.

Incidence of Heart Disease in the County Boroughs.

Some reference may be made to the incidence of heart disease in the county boroughs. As the deaths at the different ages in the several county boroughs had been extracted for the purpose of summation with those in the administrative counties with which they are associated, and as the corresponding populations were readily obtained, the standardised death-rates from age 25 and upwards were calculated for each borough. The standardised death-rate from organic heart disease amongst persons in all the county boroughs taken together exceeds that for England and Wales as a whole by 9.5 per cent. and that for the rural districts of England and Wales by nearly 18 per cent. Dr. J. Brownlee (1922) has shown, however, that the apparent excess in mortality from valvular heart disease in town over country practically disappears when the life table death-rate is used as the criterion. In the data for the four years' period 1911-14 (see table) the standardised death-rates from heart disease in the different county boroughs show a considerable range of variation. The highest values are found in Bury, South Shields, Oldham, West Hartlepool, Chester, Rochdale, and Worcester. Though these include some of the chief industrial county boroughs of Lancashire, Durham, and the West Riding of Yorkshire, and though other industrial boroughs of these counties show relatively high values, certain other boroughs therein—e.g., Sheffield, Wigan, and Bolton, in which industrial activity is apparently quite as intensive as in those already named—have relatively low mortalities from heart disease. Moreover, the cities of Chester and Worcester

are two boroughs in which the mortality-rates from heart disease are amongst the highest that are found, and they are not pre-eminently industrial. From this it would appear that, though the environmental conditions that are associated with great intensity of industrial activity may have some influence in determining the incidence of heart disease, it cannot be said from the present data that an excessive mortality from this cause is a feature in all the boroughs that may be described as industrial.

Conclusions.

From the data that have been investigated, it seems reasonable to draw the following conclusions:—

1. The mortality from heart disease in the counties of England and Wales shows quite definitely a tendency to a special distribution in which the higher death-rates are found in the counties towards the west.

2. The geographical distribution of the relative mortalities in the periods examined is very different from that described by Haviland as occurring in data for an earlier epoch, and the explanation offered by him—namely, that the excessive incidence is found in counties that are distant from the sea and sheltered by their physical surroundings from the sea winds, cannot be held to account for the distribution of the fluctuations in incidence in the present data.

3. A definite association exists in the counties between the distribution of mortality from organic heart disease and heart diseases in the aggregate and the mortality from acute rheumatism. The relative incidence of acute rheumatism appears to be the essential factor that determines the incidence of heart disease, although other factors, possibly mainly environmental, may have some influence on the rate of mortality in different districts.

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THE THERAPEUTIC PROPERTIES OF STOVARSOL (ACETYLAMINOPHENYLARSINIC ACID, "190").

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THE acetyl derivative of amino-oxy-phenylarsinic acid, first introduced into therapeutics in 1922, possesses such interesting curative and preventive properties that it has seemed to me to be of sufficient importance to warrant a review of the question to the point to which it has now developed. I shall first outline the facts relating to the discovery of the parasitocidal properties of stovarsol, and then review the results obtained with this product in syphilis, yaws, malaria, amœbiasis, and other intestinal parasitic infections.

Historical.

Acetylaminophenylarsinic acid was first prepared in Germany by Ehrlich, Benda, and Berthelm,¹ but the compound was not systematically examined by these authors. As a matter of fact, it belongs to the series of arsenical compounds known as "arsinic acids," in which the arsenic is pentavalent, and Ehrlich considered the members of these series quite inferior to the "arsenobenzenes," in which the arsenic is trivalent. However, in 1922, Fournieu,² at the Institut Pasteur, decided to re-investigate the

arsinic acids, believing the unsatisfactory results obtained in Germany to be directly attributable to the presence of certain impurities which the compounds of these series are apt to contain. Fournieu, and his co-workers Mr. and Mme. Trefouel, re-prepared almost all the members of the series, carefully purified them, and then tested them on both animals and human beings, injecting them either intramuscularly or subcutaneously. Tests were carried out with amino-oxy-phenylarsinic acid ("189") and stovarsol ("190") in experimental syphilis by Levaditi and Navarro-Martin,³ and in human syphilis by L. Fournier and his co-workers, Guenot and Schwartz.⁴ The results obtained in human syphilis were very interesting; however, in view of the fact that relapses were observed, the product, thus administered, did not seem to have an action comparable to that of the arsenobenzenes.

Such was the condition of affairs when, following their studies on the action of bismuth compounds, Sazerac and Levaditi⁵ demonstrated the value of a prophylaxis of syphilis by the simple ingestion of an efficient spirillicidal compound, a method in itself more practical than injections or local applications of pomades. The experiments carried out with soluble bismuth salts (lactate) administered by the mouth having failed to give very encouraging results, Levaditi and Navarro-Martin⁶ then tried the arsenicals. Inasmuch as they had already tested acetylaminooxyphenylarsinic acid in subcutaneous injection, they used the same compound, prepared by Mr. and Mme. Trefouel according to Fournieu's directions, and this time they administered it by the mouth.

The experiments were undertaken first from the prophylactic and then from the curative standpoint. The first observations showed that stovarsol exerted, in man as well as in small animals, a distinct prophylactic and curative action in syphilis. These were completed by numerous and convincing clinical observations by Fournier and his co-workers. Thus was inaugurated the introduction into the therapy of syphilis of an arsenic acid administered by the mouth. In what follows we shall see to what an extent this therapy has developed.

General Considerations.

It is quite proper to ask, at this juncture, if indeed this new therapy offers any advantages over the older methods of administering arsenical compounds. From the very beginning of their work, Levaditi and Navarro-Martin noticed that, when given by the mouth in experimental syphilis, stovarsol was more active than when injected under the skin or into the muscle. At the same time they remarked that its toxicity was greater in the first case than in the second. (In this connexion cf. the clinical observations of Fournier and his colleagues, and the recent researches of Navarro-Martin and of Kolle.⁷) How was this surprising fact to be explained? Very probably the compound undergoes in the intestine or in the liver certain modifications more favourable to its therapeutic action than the changes which take place in the other tissues or in the general circulation. The intestinal tract, then, is more favourable to the development of the therapeutic effects of stovarsol, and this is a distinct advantage. Again, it often happens, in practice, that it is impossible to treat syphilitic patients by the injection (even intramuscular) of any spirillicidal compound whatever. It may also be necessary with some patients to give a supporting treatment during the interval between two series of arsenic or bismuth injections. Such a treatment is easily given with stovarsol. These constitute serious arguments in favour of this new therapy per os.

Let us now examine briefly what we know of the results obtained with stovarsol in syphilis, and in other diseases such as yaws, the intestinal parasitoses, malaria, and, in fact, wherever the use of this compound has afforded an opportunity of collecting interesting data.

1. *Stovarsol in Syphilis.*

Besides the first experiments of Levaditi and Navarro-Martin, referred to above, particular attention should be called to the work of Fournier and his co-workers, Levaditi, Navarro-Martin, and Schwartz.⁸ These authors treated 80 syphilitic patients by ingestion of stovarsol in the form of tablets containing 0.25 g. Four tablets, representing a dose of 1 g., were given every morning in a little water before breakfast in periods of from five to seven days, each period being followed by an interval of equal length. In this way a total dose of 12-16 g. of stovarsol was given the first month. This method of administration was decided upon with two ideas in view: First, better arsenical impregnation, and second, prevention of accumulation. (Mr. and Mme. Trefouel had previously demonstrated that the elimination of the arsenic, which is abundant during the first two or three days, decreases very considerably on the following days.)

According to these authors, stovarsol exerts, in a great number of cases, a remarkable action on the primary, secondary, and tertiary erosive and ulcerous lesions, an action which is often as rapid as that of the arsenobenzenes given intravenously. The product induces a rapid healing of the superficial syphilitic lesions; it is capable of arresting the evolution of the disease and of exerting a favourable effect on the blood reaction. As a matter of fact, Fournier and his co-workers have published a number of serological curves in which are shown either the rapid negatization of a sero-reaction which was strongly positive at the beginning of the treatment, or the maintenance of a negative Wassermann in cases where the treatment with stovarsol was begun in the pre-serological period. To this must be added the excellent tonic effect which the compound exerts on the general condition of the patients. Naturally enough, as with every other arsenic compound, there will be encountered some cases both of arseno-resistance and of relapse. For this reason, Fournier and his fellow-workers look upon stovarsol as a weapon to be used in attack either alone or in association with another specific such as bismuth. "The benefit of the absorption of '190' (stovarsol) per os is absolutely real in every case where, for any reason whatsoever, intravenous or subcutaneous injections of antisyphilitic medicaments are impracticable."

The results of these researches have been generally confirmed by several authors in France as well as in Germany. In France, Yovanowitch,⁹ in a noteworthy thesis, declares that stovarsol has a marked antisyphilitic power, comparable with that of the arsenobenzenes and the salts of bismuth. Its action is directed, however, very much more against the infectious cutaneous and mucous lesions, which it sterilises, than against the serological reactions, which it influences more slowly than either bismuth or the arsenobenzenes. Thus, whereas in some cases the author has recorded a total negatization of the Wassermann, in others there was only a marked attenuation of the reaction. However, the author himself recognises that the treatment with stovarsol was never very intensive. "It is logical to think," says Yovanowitch, "that with stronger doses the stovarsol would have exerted a deeper action on the evolution of the syphilis, and would have more strongly influenced the Bordet-Wassermann reaction."

Again, Cadenaule and Clarac¹⁰ report evidence to show that hereditary syphilis is susceptible of being treated efficaciously by stovarsol. One of their observations is to the effect that stovarsol, given half an hour before feeding, is perfectly tolerated by the new-born, that there is advantage in administering high doses (0.12 g. per day for a child weighing 3 kilos), and that the results are most satisfying: disappearance of the cutaneous lesions and of the coryza, marked general improvement, and increase in weight.

In Germany we would call attention to the work of Oppenheim, of Heymann, and of Weitgasser. The

first-named author¹¹ finds that stovarsol administered per os acts in a manner which is rigorously specific even in a dose of 0.25 g. He gives six observations in support of this view. The product acts on the syphilitic lesions and the treponema quite as strongly as mercury, bismuth, or salvarsan. In a second and longer report,¹² Oppenheim describes a large number of observations which permit him to form the conclusion that no other antisyphilitic agent given per os exerts as marked a therapeutic action as stovarsol, which, when properly administered, is perfectly well tolerated by the patients. Its influence on the treponema and upon the specific lesions is comparable with that of the arsenobenzenes; moreover, it determines an increase in weight. Apparently relapses are rare, for Oppenheim reports only two out of the 83 cases treated.

The indications are hypersensitiveness to salvarsan, difficulty of giving intravenous injections, impossibility of applications other than per os, replacing salvarsan in its association with mercury or bismuth. According to Oppenheim, the treponemata disappear in 24-48 hours, the primary lesions heal in 5-15 days, while the eruptive manifestations of the disease disappear in a few days.

The conclusions of Heymann¹³ are very similar to the above. They show that stovarsol is perfectly tolerated¹⁴ even when given in daily doses of 1 g., and a total dose of 20 g. in a month. The author believes that this compound is, at the present time, the most active antisyphilitic agent which can be given per os. It has a most satisfactory action on all of the ordinary manifestations of syphilis, and exerts a favourable influence on the Wassermann reaction. Heymann is likewise of the opinion that stovarsol can be administered in conjunction with bismuth or mercury. Weitgasser¹⁵ is more reserved in his opinion. He recognises the manifest spirillicidal action of the new product, but has not so far observed any profound and lasting effect on the Wassermann. The question may be asked, however, whether, in the cases treated by Weitgasser, the treatment was sufficiently intensive.

From the foregoing, the basis for the use of stovarsol as an antisyphilitic seems firmly established. In our own opinion, the new medication is applicable to the rapid sterilisation and healing of the specific lesions, whatever they are; in other words, it constitutes a method of curative prophylaxis of which the advantages cannot be overrated. If, in a great many cases, treatment exclusively by stovarsol is sufficient to determine healing of the lesions and to render the Wassermann persistently negative, in other cases it is necessary to associate with stovarsol another powerful specific drug, having a somewhat deeper and more durable action, such as bismuth. The advantages of an arsenical treatment with stovarsol lie in the spirillicidal strength of the compound, the ease with which it is administered, and its general tonic action on the whole system.

2. *Stovarsol in Yaws.*

Yaws, the ulcerous disease caused by *Spirocheta pertenuis* (Castellani), responds, like syphilis, to treatment with stovarsol. This has been demonstrated by the recent work of Beurnier and Clapier,¹⁶ who report excellent results. They recommend doses not exceeding 1 g. in 24 hours, an entire cure requiring 8 g. for an adult weighing 50 kilos. Baermann¹⁷ has studied the preventive action of stovarsol in yaws, and has observed that the compound given in a total dose of 3.75 g. in four days is capable of protecting man from a massive infection. He reports similar results with monkeys. Tanon and Jamot¹⁸ remark that stovarsol cures the lesions of yaws even when they have proven resistant to the arsenobenzenes. They further observe that children seem to tolerate the product as well as adults, that it is advantageous to administer stronger doses at the beginning and to reduce them later, and, finally, that the fact that its administration by the mouth makes

it very acceptable to the natives, who exhibit a certain apprehension of injections in general, of whatever sort.

To close this chapter on the spirillary diseases curable by stovarsol, let us simply mention intestinal spirochætososis (Waldorp¹⁹), ulcero-membranous stomatitis (Sabrazes²⁰), spirillary bronchitis (Fontanel²¹), (Couvry²²), phagedenic ulcer (Couvry²³), Vincent's angina (Couvry²⁴), (Cot²⁵), &c.

3. Stovarsol in the Intestinal Parasitoses.

Ravaut²⁶ was the first to use arsenicals by the mouth in the treatment of intestinal amœbiasis. He used the arsenobenzenes for this purpose, and stated the facts in favour of this method. But it is to Marchoux²⁷ that we owe the discovery of the parasitocidal and curative action of stovarsol in amœboid dysentery and intestinal lamblasis. In two papers published in 1923 he reported the first results obtained with stovarsol in the treatment of these diseases. His observations have been confirmed by Delanoe,²⁸ Leger and Nogue,²⁹ Fontanel,³⁰ Rubenthaler and Jansion,³¹ Leon Bernard and Thomas,³² and still more recently by Petzetakis.³³ Marchoux has recently published³⁴ a review of the results obtained, and we cannot do better than to give a summary of his paper at this point.

Amœbiasis.

Between March, 1923, and July, 1924, Marchoux treated by means of stovarsol 59 patients infected with *Amœba dysenteriae*. The infections had been obtained in France, Germany, Orient, Morocco, Syria, and in the French Colonies. Of these 59 patients, all but two were very successfully treated. Of these two, the first had a dysentery which resisted every treatment tried, while the second showed improvement only while the treatment was in progress. In all the other cases the amœba and the cysts disappeared on the second or third day, while the quantity of stools diminished and their consistency became firmer. In addition, there was a general improvement in the general health of the patients, and a subsiding of the secondary effects of the infection. In order to avoid any possibility of relapse, Marchoux recommends a supporting treatment of two tablets a day (0.50 g.), the medicine being taken regularly at meal-time for six weeks. Certain dietary precautions are also recommended: complete abstention from tobacco, from all alcoholic beverages, and from fresh butter.

Petzetakis, of Athens, has treated with stovarsol a number of cases of intestinal amœbiasis, lamblasis, and diarrhoea due to various species of trichomona, and comes to the following conclusions. Stovarsol is an excellent remedy for the intestinal parasitoses. The compound destroys the amœba, and in some cases its favourable action is evident during the first 24 hours of treatment. There are some cases, however, which prove resistant or which relapse. He suggests that in these cases the dosage be increased or the treatment prolonged. The treatment is applicable to children as well as to adults. Finally, Petzetakis insists upon the fact that stovarsol exerts a preventive action against infection by *Amœba dysenteriae*, and mentions a case in support of this contention.

Lamblasis.

Marchoux³⁵ has treated 21 cases of intestinal lamblasis, with diarrhoea and presence of lamblia in the faeces. Treatment with stovarsol produced an immediate improvement, and, even with small doses, the cysts disappeared from the faeces. In some cases, however, the cysts reappeared if treatment was stopped completely. A supporting treatment of 0.25 g. (one tablet) of stovarsol per day is therefore recommended. According to Marchoux³⁶ stovarsol always destroys the blastocysts, which are the cause of the persistent diarrhoea.

Malaria.

If, on the one hand, Baermann (loc. cit.) was nable to obtain a preventive action in tertian

malaria by using stovarsol as a prophylactic agent, on the other hand Valenti and Tomaselli³⁷ have called attention to the efficacy of the product given per os in tertian and quartan fever. In a short paper, which appeared last September, these authors cited a case of malaria (quartan type), with repeated accesses of fever extending over a year, which had resisted intensive treatment with quinine. Plasmodia were present in the blood-stream. Treatment was begun with stovarsol (one tablet the first day and two tablets each day following). There was a single access of fever after beginning the treatment and no relapse, although the patient was observed for more than a month afterward, and in spite of the fact that the stovarsol was discontinued on the eleventh day. The plasmodia disappeared from the blood-stream on the sixth day. The second case was similar to the first except that it was of the tertian type.

Independent of Valenti and Tomaselli, Marchoux and Cohen³⁸ have studied the action of stovarsol in tertian malaria in general paralytics intentionally infected (method of Wagner). Seven patients were treated by intravenous injection of a solution of the sodium salt of stovarsol. The product seemed active to the extent that the attacks of fever ceased and the parasites disappeared from the blood-stream. In a second paper, Marchoux³⁹ describes the results of experiments undertaken with 136 malarial patients at Marengo, Algeria. The treatment consisted of the ingestion of 1 g. of stovarsol per day, or the intravenous injection of a similar quantity of its sodium salt. Marchoux concluded that stovarsol is effective against *Plasmodium vivax*, but does not seem to be very active against either *Plasmodium malarie* or *Plasmodium falciparum*.

Although these observations are still not sufficiently numerous to permit the formulation of definite conclusions, it would appear that stovarsol, either given per os or by intravenous injection of its sodium salt, acts on malaria causing the disappearance of the parasites and a suppression of the accesses of fever. It will be for further research to show whether or not certain forms of malaria respond to this treatment, and whether or not the curative action is lasting. In any case, these researches will be of particular interest.

Conclusion.

Starting with a study of the prophylaxis of syphilis by way of the mouth, the field of action of stovarsol has become, in a very few years, greatly enlarged. One after the other, the treatment of syphilis, of yaws, of spirillary infections in general, of amœboid dysentery, of intestinal lamblasis, of the blastocystic diarrhoeas, and, very probably, of malaria also have benefited by this new arsenic compound or rather by this new method of treatment per os. The efficacy of the method, its exceeding simplicity, and the security which it gives in a multitude of circumstances render it worthy of the attention of medical men, who, in their turn, are called upon to pass judgment upon it without any preconceived ideas, as is always proper when it is a question of controlling the observations made by conscientious workers.

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Clinical and Laboratory Notes.

A CASE OF LUMINAL POISONING.

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THE following case of poisoning with luminal is probably worthy of record, for the symptoms, although alarming at the time, were followed by complete recovery.

A sober woman of 69, in collision with a cyclist on Nov. 24th, 1924, received a blow on the back of the head which momentarily stunned her. She found her way home and at once exhibited evidence of mental impairment. For example, she filled hot-water bottles with cold water, and next morning came downstairs with fish knives in her hair and proceeded to pour out tea into the milk jug. The sphincters were uncontrolled.

She was admitted to hospital on Dec. 1st, garrulous, incoherent, confused, and incontinent. There was an unclean scalp wound over the occiput in the middle line. There was no evidence of fracture, intracranial hæmorrhage, or defect of the visual apparatus, but the left pupil was larger than the right. There was no aphasia or paresis, and there was no sign of affection of the motor or sensory pathways. The systolic and diastolic blood pressure measured 140 mm. and 80 mm. of mercury respectively. The serum and cerebro-spinal fluid were healthy.

By Dec. 24th her symptoms had somewhat abated and the sphincters were controlled. She was still restless, garrulous, and confused. Luminal and potassium bromide in small doses were prescribed but, inadvertently, gr. 10 of the former and gr. 50 of the latter were administered daily for 12 days (total luminal gr. 120, potassium bromide gr. 600). On the twelfth day, Jan. 4th, 1925, she became stuporose and had a recurrence of double incontinence. The pupils were much contracted and lost their reaction to light. At times there was a divergent squint. The pulse-rate was increased. The cerebro-spinal fluid was under normal pressure. The urine contained no hæmatoporphyrin. After stimulation and a long delay she feebly obeyed certain instructions. Energetic treatment was employed in the form of strychnine, hot coffee by mouth and rectum, oxygen, and faradism. The luminal and bromide were cancelled. For a few days the periods of mental alertness increased in length but on each occasion she relapsed rapidly into stupor. Her conversation showed extreme confusion of thought. The tendon and superficial reflexes were unaffected throughout. By Jan. 10th the urgent symptoms were relieved and the sphincters once more under control. The systolic blood pressure measured 120 mm. of mercury. The pupils remained unequal and reacted to light very sluggishly. Then followed a period of four weeks in which she was greatly confused. On Jan. 19th, for example, her answers to questions were as follow. Year?—March. Age?—59. Year of birth?—1956. Age?—Westerham. War?—China versus Chilians. Her handwriting was illegible and her composition grotesque. She knew not where or who she was. She expressed a fear of being killed by a firing party, and she said that her sister

(Continued from previous page.)

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38. Marchoux and Cohen: Soc. de Biologie, 1925, xcii., 132.
39. Marchoux: Comptes Rendus de l'Acad. d. Sciences, 1925, clxxx., 617.

had fallen into a basket of damsons and, not being a business woman, would lose her money. She saw pistols in the hands of other patients and said that they wore leather helmets as a precaution against being killed. Her intelligence, judged by the accuracy of her replies to questions, varied from hour to hour. Rarely could her attention be secured.

On Feb. 10th Dr. H. J. Norman saw her with me and found her depressed and anxious, readily confused, and unduly apprehensive. The next day she rushed screaming round the ward and refused to be pacified until the windows, which had been closed for the round, were reopened. On Feb. 12th she made a sudden and complete recovery and her memory for the recent and distant past was once more clear.

Convalescence has been uninterrupted. She went to the seaside on March 5th, and recently I have had from her a grateful letter of a woman in complete possession of all her faculties. I call attention to the amount of the drugs taken, the value of faradism in treatment, and the avoidance of certification.

A CASE OF

RENAL GLYCOSURIA WITH KETONURIA.

BY J. PATTERSON, M.Sc., Ph.D.

(From the Biochemical Department, Charing Cross Hospital.)

WHILE the crucial means for distinguishing between diabetes mellitus and renal glycosuria lies with the sugar-tolerance test, it is generally recognised that confirmatory to a normal curve indicating renal glycosuria is a urine examination showing a fairly constant and low value for the percentage of sugar, with the complete absence of acetone bodies. A negative finding with regard to these latter substances is such an invariable result in this type of case that one might have assumed reasonable certainty in diagnosing diabetes wherever an obviously positive glucose test was accompanied by an authentic acetone reaction in the urine. In only one case of renal glycosuria so far described (Allen, Wishart, and Smith, 1919,¹) have ketone bodies been detected, but then only at the time the patient was admitted to hospital, for when placed on full diet the acetone test immediately became negative.

It would seem, therefore, to be of interest to supply a few details pertaining to a case which was quite exceptional in that the urinary examination was apparently contradictory to the findings based on blood analysis.

Clinical Record.

The patient, a man aged 42, was admitted to hospital with a history suggestive of pulmonary tuberculosis and diabetes.

History.—In 1911 he underwent an operation for gastric ulcer, at which time he was discovered to have sugar in the urine and was evidently regarded as diabetic. Later, he attended a hospital as an out-patient for six months, being told to diet carefully. Towards the end of 1918 he developed a bad cough, afterwards began to have night-sweats, and also brought up dark-coloured sputum. He had dyspnoea on exertion and suffered from loss of strength. Going before a medical board, he was X rayed and phthisis suspected, but shortly afterwards the cough improved and the night-sweats ceased. During the last six months preceding admission, dry red rashes appeared on the left thigh, both forearms, and scrotum. He had been thereupon examined at a skin hospital, where it was believed his skin disease was related to a diabetic condition.

No evidence of active pulmonary tuberculosis being found, a brief inquiry into his "diabetic" condition was instituted, with the results recorded below.

Chemical Findings.

1. On full diet.—Sugar and acetone constantly present in the urine, former identified as glucose in the form of phenyl-glucosazone; amount varying from 0.5 to 3 per cent.; latter confirmed by Lieben and by Gunning tests after distillation.

	Blood-sugar.	Nitro-prusside test.
29/1/25	0.091	+
30/1/25	0.085	+
31/1/25	0.090	+

¹ Arch. Int. Med., xxiv., 523

2. *Potatoes withdrawn from full diet.*—Sugar absent from urine the first day, reappearing to the extent of 2 per cent. on subsequent days. Acetone as before.

3. *Starvation.*—Sugar absent within 24 hours, marked nitro-prusside reaction first day with positive Gerhardt test, intense colour reactions on the second day, after which the patient was restored to full diet.

4. Glucose-tolerance tests.

—	Blood-sugar.	Urine.	
		Sugar.	(1) Acetone diacetic. (2) β -Hydroxybutyric.
(a) (6/2/25)		per cent.	mg. per cent.
Before glucose . . .	0.085	0.65	(1) 10.6 (2) 20.0
After glucose . . .	—	1.80	(1) 7.3
1 hour	0.121	—	—
1 „	0.120	—	—
2 hours	0.097	—	—
3 „	0.075	—	—
(b) (12/2/25)			
Before glucose . . .	0.090	2.0	(1) 4.0
After glucose . . .	—	3.2	(1) 2.6
2 hours	0.103	—	—
3 „	0.080	—	—

Urines collected for four-hour periods both before and after glucose.

5. *Other findings.*—Blood-urea, 32 mg. per 100 c.cm.; cholesterol, 0.250 per cent.; urea concentration (1) 3.1 per cent., (2) 3.6 per cent. Acetone plus aceto-acetic acid and hydroxybutyric acid were estimated by the method of

Wrigglesworth (1924),² and are much in excess of the most recent average normal values, which are given by Hubbard and Noback (1925)³ as 0.9 mg. per 100 c.cm. and 0.46 mg. respectively.

Discussion.

The most striking feature, then, is the continuous excretion of acetone bodies, a fact not merely based on a positive reaction but confirmed by more conclusive tests. Its relation to the sugar excretion, itself rather greater and at the same time more variable than in the typical renal glycosuria, is difficult to follow. The mere loss of about 20 g. of sugar per day would normally hardly result in the appearance of acetone, especially where it could be shown that the withdrawal of carbohydrate in the form of potatoes from the diet, or on the other hand, the addition of glucose, had no appreciable effect.

The appearance of a ketonuria in these circumstances is evidently contrary to the present-day theories as to the relationship between carbohydrate and fat metabolism, unless it be assumed that in addition to a very low threshold for sugar the patient had also a lowered threshold for acetone. Unfortunately it was not found possible to carry the investigation further in order to establish whether this were so or not, but since the abnormality cannot be accounted for on the basis of lack of carbohydrate utilisation, it seems feasible to suggest that its cause is a parallel one to that responsible for the abnormality of the accompanying sugar excretion.

² Biochem. Jour., xviii., 1203. ³ Jour. Biol. Chem., lxxiii., 391.

BRITISH MEDICAL ASSOCIATION. ANNUAL MEETING AT BATH.

SECTION OF LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY.

THIS Section met on three days, under the presidency of Mr. Arthur H. Cheate.

WEDNESDAY, JULY 22ND.

OVERLOOKED CASES OF FOREIGN BODY IN THE AIR AND FOOD PASSAGES.

A discussion on this subject was opened by Prof. Chevalier Jackson (Philadelphia). He said that his presentation of the subject was from the individual viewpoint of one who metaphorically as well as actually saw narrowly through a small tube; for the broader viewpoint the audience was referred to the internist. Of the 1485 cases of foreign bodies that had come to Prof. Jackson's bronchoscopic clinic in the past 20 years there were over 200 in which foreign bodies had been overlooked for periods of from one month to 36 years. A broad consideration of the histories of these cases showed the outstanding fact that the failure to recognise the presence of a foreign body was due not so frequently to inability to make the diagnosis, as to failure to attach sufficient importance to the consideration of foreign body as a diagnostic possibility. Foreign bodies had been regarded as curiosities of medicine rather than routine possibilities for exclusion. A careful analysis of all the cases in which records were accurate, however, showed that the chief factors in the overlooking of the foreign bodies (not in the aetiology of the accidents themselves) were as follows: (1) Failure to consider foreign body as a diagnostic possibility. (2) Absence of a history of foreign body as proven by over 100 cases at the clinic. (3) Scepticism as to the possibility of the presence of a foreign body, in some instances even in the face of a very positive circumstantial history of the accident. (4) The apathetic attitude of the practitioner. (5) The symptomless interval which usually elapsed after the swallowing of a foreign body. (6) Multiplicity of foreign bodies, one being removed, but others

being left behind; this could be avoided by X ray examination after as well as before operation. (7) Waiting for spontaneous expulsion of the foreign body. (8) Simulation, in foreign body cases, of the signs and symptoms of common diseases, such as tuberculosis, asthma, bronchitis, pneumonia, empyema, bronchiectasis; foreign body in the lung would continue to be overlooked until the practitioner deemed it necessary to exclude foreign body in every case of acute or chronic pulmonary disease. (9) Lack of emphasis, in medical teaching, on the exclusion of foreign body in every case of acute or chronic disease of the chest. (10) Groundless assumption of passage by the bowel. (11) Character of the foreign body; vegetable seeds, for example, which did not cast a shadow on X ray examination, might be overlooked. Occasionally, even after a diagnostic bronchoscopy, there might be uncertainty as to the possibility of a small fragment of non-opaque foreign body in a minute bronchial branch; such cases required watching, for sooner or later signs would develop. Every case in which there was the slightest intimation of a foreign body accident, or of the patient having had an attack of choking, gagging, strangling, or coughing, should be regarded as a prima facie case of foreign body. A foreign body, he said, should be regarded as present until the contrary was proven by every means at command. The justification for that rather strong statement was that among his cases there were dozens of histories in which a child after having choked and gagged with food or some foreign substance in his mouth was taken to a practitioner or to a dispensary, or to an out-patient clinic, when entirely symptomless. Physical examination being negative, the parents were reassured and the child sent away. The symptomless interval, often of prolonged duration, prevented connexion of the initial symptoms with the tardy development of the symptoms of foreign body. The Rontgen ray was the most valuable diagnostic means in suspected foreign body; but careful notation of physical signs by an expert should be made in all cases. Expert X ray work would show all metallic foreign bodies and many of less density, such as teeth, bones, shells, buttons, and so forth. If the X ray was negative for foreign body but indicated bronchial obstruction, a diagnostic bronchoscopy should be done. Peanut kernels and water-

melon seeds in bronchi produced obstructive emphysema of the invaded side, which should be distinguished from compensatory emphysema, in which the ballooning was in the unobstructed lung.

The relative rarity of foreign body in the air and food passages should not render it an unreasonable rule to exclude foreign body in every ailing child, for was it not a rule for all internists and pædiatrics to exclude Banti's disease as a matter of routine—yet what single clinician or clinic ever saw 1400 cases of Banti's disease? As regards the treatment of overlooked foreign bodies in the lungs, it might be said that 98 per cent. of the localisable foreign bodies of appreciable size that had reached the trachea, bronchi, or parenchyma of the lung through the mouth could be removed by peroral bronchoscopy, and no procedure other than peroral bronchoscopy was entitled to a moment's consideration in the ordinary case of foreign body in the lung. One of the most remarkable things was the recuperative power of the lung from a seemingly very serious pathological condition by a foreign body after the intruder had been removed.

After his opening address Prof. Jackson gave a demonstration on the manikin of mechanical problems of the bronchoscopic and œsophagoscopic extraction of foreign bodies from the air and food passages. After this demonstration he exhibited a number of cinematograph films demonstrating bronchoscopic aspiration for suppurative diseases of the lung of other than foreign body origin; it was remarkable to note the absence of discomfort in patients in whom bronchoscopes were passed into the lungs for aspiration, without any anæsthetic, local or general, in the skilled hands of Prof. Jackson's assistant, Dr. Gabriel Tucker.

Prof. Thomas McCrae (Philadelphia) said that the association of physicians with laryngologists was necessary if there was to be any improvement in the handling of the problem of foreign bodies in the lung. The bronchoscopist had the right to ask the general practitioner and the internal physician that they should be alert and make the diagnosis promptly; they, on their side, had the right to ask that certain laryngologists at least should acquire such skill in bronchoscopy that they could have patients referred to them in the assurance that they would be skilfully handled, and that if necessary a bronchoscopy for diagnosis could be done with perfect safety. He placed emphasis on the importance of the failure to consider the possibility of a foreign body in the air passages; to lessen that mistake a steady process of education was essential, and so long as a foreign body in a bronchus was regarded as something like a fairy tale little progress could be made.

Sir StClair Thomson (London) expressed the thanks of the meeting for Prof. Jackson's brilliant demonstration; he thought that foreign bodies in the air and food passages must be more common in America than in this country, and he blamed the acquisitive habits of the American child.

Sir William Milligan (Manchester) said that he regarded the intimate coöperation with the radiologist as of the utmost value, but where a negative report was given he thought that in any doubtful case an endoscopic examination should be made. He was in favour of a second X ray examination being made after the removal of the foreign body as other foreign bodies might be present. He had known of cases being treated as tuberculosis for years, and clearing up at once on removal of an unsuspected foreign body.

Mr. Herbert Tilley (London) described a typical case of overlooked foreign body, that of a boy who inhaled a paper-fastener into the left bronchus, which illustrated some of the pitfalls which might lead to the overlooking of a foreign body; the chief reason why the case had drifted on was that the chest was not radiographed by an expert directly the trouble occurred. He wondered how many cases of "bronchiectasis," "bronchitis," "pneumonia," and "tuberculosis without tubercle bacilli" had been

caused by the presence of an overlooked foreign body, and referred to cases which he had recorded in THE LANCET.¹ If the foreign body was not opaque to X rays the chest should be screened at the moment of full inspiration and again on deep expiration, and a comparison of the two negatives would often show striking differences.

Sir James Dundas-Grant (London) described several cases of overlooked foreign body which had occurred within his own experience. He asked about the use of lipiodol and bismuth in the detection of non-opaque foreign bodies.

Mr. Douglas Crow (Brighton) detailed some of the early difficulties which he had experienced in bronchoscopy; he had found that the practitioner sometimes overlooked the bronchoscopist as well as the foreign body, even when the latter had been demonstrated by X rays.

Mr. G. Ewart Martin (Edinburgh) discussed chiefly the possibilities of the bronchoscope in the diagnosis and treatment of certain affections of the chest: he had obtained very satisfactory results, particularly in the treatment of bronchiectasis by bronchoscopic lavage.

Mr. E. B. Waggett (London) maintained that no examination for suspected foreign body was complete without a skiagram taken in the right antero-lateral position, as in well-developed adults lateral skiagrams of the chest were often obscure.

Mr. Musgrave Woodman (Birmingham) described two cases which came under the category of overlooked foreign bodies in the œsophagus, and showed lantern slides illustrating them.

Dr. P. Watson-Williams (Bristol) referred to the pulmonary symptoms in bronchial occlusion.

In the afternoon, at the Bath Ear, Nose, and Throat Hospital, Mr. V. E. Negus read a paper on evolutionary factors in the causation of pharyngeal diverticula, and also demonstrated a large number of specimens which he had dissected, to illustrate the comparative anatomy of the nose and throat.

Mr. Irwin Moore read a paper on the history of endoscopy, and demonstrated a number of valuable specimens from the special Endoscopic Museum which was the chief feature of the Pathological Museum of the Annual Meeting, and for which he had collected a large number of pathological specimens, endoscopic instruments, &c., from all over the country.

THURSDAY, JULY 23RD.

Chronic Middle-Ear Suppuration.

Mr. G. J. Jenkins (London) opened a discussion on the operative treatment of this condition. He said that operations in cases of chronic suppurative disease of the middle ear were undertaken primarily for the removal of the conditions which were potentially dangerous; secondarily in order to get rid of an offensive state which often necessitated a good deal of care and daily attention; and also, in some instances, with the possibility of improving the hearing. Of recent years many otologists in all parts of the world had been experimenting with methods that were something between the Schwartze operation and the radical mastoid, and which had been termed "conservative mastoid" or "modified radical mastoid" operations. This endeavour to find something better than the radical mastoid operation must have arisen because the latter had been found to be insufficient or defective in some respects. The result was not always satisfactory; sometimes the Eustachian tube remained patent, no matter how carefully that had been provided against. Often the hearing was damaged and sometimes the ear required careful attention for years, even when epithelialisation had been quite satisfactory. Whatever operation was done, the objects should be: (1) to remove all foci of potential danger; (2) to retain the maximum hearing; and (3) to leave a state of affairs that would necessitate the least

¹ THE LANCET, 1908, ii., 1359, and 1911, i., 1066.

possible after-attention. Rapidity of healing was a secondary consideration. The cases could be divided into three groups. In the first, the hearing was good, almost as good as in a normal ear, the mechanism of the middle ear not having apparently been damaged; in the second group were included those cases in which the middle ear conducting apparatus had been involved; the third group included those cases in which there was evidence of a gross lesion of the wall of the labyrinth or of the labyrinth itself. In the second group he had tried a modified radical operation of his own devising, the special clinical features which constituted suitability being the presence of a small perforation entirely or almost entirely surrounded by membrane, and evidence that the incus had been damaged; altogether he had operated on 38 cases. The operation might be described as an extended Schwartz operation, with removal of the incus, and the obliteration of the antrum and mastoid cavity by means of a flap of periosteum. The object in removing the incus was, first, to eliminate what he believed to be an important focus of disease which was unlikely to clear up spontaneously; and, second, by its removal he thought that ample drainage would be provided for the antral region until healing had occurred. When, however, there was a serious affection of the tympanic cavity, and especially when the tympanic membrane was extensively destroyed, Mr. Jenkins did not think the results from any form of conservative operation were equal to or as good as those of the radical mastoid operation.

Mr. Sydney Scott (London) said that in a case open to doubt as to the necessity for extirpation of the tympanum, when there was no cholesteatoma and no labyrinth disease, even where hearing was very defective, it was permissible to watch the effect of Schwartz's operation as modified by Küster before advising conversion to the epitympanic operation or to the radical operation. For years at St. Bartholomew's Hospital they had recognised the advantages in operating in two stages on conservative principles. Mr. Jenkins had systematised a new stage of conservatism, not a new stage of eradication.

Mr. J. Bowring Horgan (Cork) emphasised that in the overwhelming majority of cases the aural calamity which was designated by the name of chronic suppurative otitis media was a preventable calamity, and that the best treatment of that condition was the thorough and courageous treatment of its progenitor, acute suppurative otitis media. As regards operative treatment, he was convinced of the great value of the primary skin graft in mastoid operations.

Mr. H. Norman Barnett (Bath) said that chronic middle-ear disease was an eminently curable condition, and if under observation and careful treatment it had not been cured in four to six weeks he advised operation and opened up the mastoid antrum. He pleaded earnestly for an early exploration of the mastoid antrum in cases of chronic ear discharge, as it was quite useless ordering drops for such a patient.

Sir James Dundas-Grant said that among the operations for chronic suppurative otitis media the claims of the operation of ossiculectomy had been overlooked. The ossicles seemed sometimes to dam up the discharge, causing violent symptoms which apparently called for a radical mastoid operation; but he had not infrequently found that the symptoms entirely subsided after the removal of the ossicles.

Dr. W. S. Syme (Glasgow) said it was most important to define the actual limits of the disease. The performance of a conservative operation could now be recommended at a much earlier period in well-defined cases in which formerly a radical mastoid operation would have been recommended.

Mr. J. Aldington Gibb (Maidstone) said that recently he had adopted as a conservative measure with good results the transmastoid atticotomy of Bondy, as practised by Sourdille and others in France.

Chronic Non-Suppurative Middle-Ear Deafness.

A discussion on the treatment of chronic non-suppurative middle-ear deafness (excluding otosclerosis) was opened by Sir William Milligan, who said that while otology had made great strides in the past quarter of a century, more especially in the treatment of suppurative disease in and around the middle and internal ears, the treatment of chronic catarrhal and otosclerotic lesions remained practically at a standstill. If it was admitted that in advanced chronic catarrhal otitis media anything approaching a cure was out of the question, our aim should be to endeavour to prevent the onset of the disease and to treat it energetically in the early stages, so as to prevent, if possible, the advent of incurable fibroid changes. In a large percentage of cases the commencement of the disease dated back to childhood or early adult life as the result of some such ailment as measles, scarlet fever, or purulent nasal catarrh. Sepsis was, in many cases, the underlying element in the production of those pathological changes which ultimately led to the connective tissue and arthritic alterations associated with chronic catarrhal otitis media. It was almost unnecessary to recapitulate the importance and the necessity of the removal of septic tonsils and adenoids, and other forms of nasal obstruction and nasal sepsis; but what was necessary to emphasise was the necessity in cases of otitis media of keeping up, for varying periods, a careful toilet of the mucosa. The sheet anchor of treatment was unquestionably inflation by means of the bag or the Eustachian catheter, repeated as often as the particular case demanded. The greater the improvement after inflation and the longer it lasted the better was the prognosis. In order to maintain the patency of the Eustachian tube all obstructive or septic lesions of the throat, nose, and naso-pharynx had to be eliminated. Repeated examination and short courses of treatment were essential if the best results were to be obtained. An important factor in chronic middle-ear deafness was the subconscious loss of acuity of the cortical centres of hearing, and he believed these centres were capable of some amount of re-education, which should be systematised and if possible simplified.

Dr. J. Kerr Love (Glasgow) said that with a sound auditory nerve one should be able to do for a case of middle-ear deafness what the optician did for a refraction error. And yet it did not work out in practice. It was not enough to send the patient to a salesman of "aids to hearing," hoping that the latter would do something. The real difficulty was that the acoustician waited upon the aurist, and the latter did not know enough of the pathology of the different types of deafness—the acoustician, of course, knew less. It was possible that because of the mixture of types of deafness the fitting of "auditory spectacles" would never be the success the lens was in the hands of the optician. But, he urged, we should not give up without further trial.

Mr. Neil MacLay (Newcastle-on-Tyne) said that people must be taught to give as much care and consideration to their ears as they gave to their eyes. Of the many remedies for chronic middle-ear deafness the most important were inflation, tympanic massage, and re-educative exercises, the last fairly claiming a certain amount of success. By employing an ordinary conversation tube, amplified if necessary by a receiver of large dimensions, the patient could read aloud to himself or be spoken to at intervals during each day.

Mr. H. Norman Barnett said that his main lines of treatment were the vaporisation of the middle ear through the Eustachian catheter with a mixture of iodine and camphor vapour, and ionisation, which was of very considerable importance in obtaining good results.

Dr. George Cathcart (London) referred to the good results he had obtained in the treatment of chronic middle-ear deafness by re-education of the hearing with the electrophonoide of Zünd-Burguet. He

attributed the improvement mainly to stimulation of the organ of Corti and of the cortical auditory centres, in addition to a certain amount of local vasodilatation.

Sir James Dundas-Grant was convinced that many cases escaped benefit through the imperfect introduction of the Eustachian catheter. In the intervals of catheterisation the patient could keep up the treatment for himself by the use of a self-inflator containing a few drops of diluted chloroform. Operative treatment was seldom of any value.

Mr. Herbert Tilley said that the early stages of chronic adhesive otitis were frequently overlooked, even by otologists. In the ordinary type of serous exudation into the tympanum, it was his practice to inject through the Eustachian catheter a few drops of 10 per cent. argyrol after having removed the catarrhal fluid by inflation and aspiration with a Siegle's speculum. A few cases improved with endocrine therapy.

Dr. W. S. Syme emphasised the importance of sepsis in the nose and throat; nasal accessory sinus disease was more common than was usually supposed.

Mr. Sydney Scott laid stress on Mr. MacLay's suggestion of employing the speaking-tube in the re-education of the hearing. Dental sepsis had an important relation to deafness, and an X ray examination of the teeth could not be dispensed with.

In the afternoon Mr. Norman Barnett demonstrated at the Bath Ear, Nose, and Throat Hospital a large number of cases of chronic middle-ear suppuration treated by conservative operation, and of chronic non-suppurative middle-ear deafness treated by vaporisation and ionisation.

FRIDAY, JULY 24TH.

Occupational Diseases of the Ear, Nose, and Throat.

A discussion on this subject was opened by Mr. F. H. Westmacott. He said that the subject might most conveniently be discussed under two headings: (1) Industrial diseases which were included in Schedule 3 of the Workmen's Compensation Act of 1906, extended by various orders, and included in the Act of 1923; (2) industrial diseases which were met with in workers but which were not so included and might or might not cause incapacity of employment. In the first category the list of diseases affecting the ear, nose, and throat included anthrax, lead, mercury, phosphorus and arsenic poisoning or their sequelæ, poisoning by nitrous fumes, ulceration of the mucous membrane of the nose or mouth produced by dust, chronic ulceration, compressed-air illness, glanders. Among the second group were inflammation of the auricle followed by slough and necrosis, as occurred in cold-storage workers; rupture of the tympanic membrane due to explosions in mining, blasting, tunnelling, or gun-firing tests; acute or oedematous laryngitis might be directly caused by inhalation of irritant fumes of chlorine, bromine, iodine, ammonia, or sulphuric acid; membranous laryngitis, non-diphtheritic, occurred in workers in steam and irritating vapour, such as in stokers and cooks; chronic laryngitis was found among professional voice users, from misuse or faulty voice production; hypertrophic laryngitis was frequent in street hawkers, salesmen, or those exposed to dusty occupations. In continuous noises, such as riveting in boiler-making or loud machinery, which gave rise to continuous nerve strain, deafness was due not so much to damage to the sound-conducting mechanism as to destruction of the sensitive nerve-endings which constituted the sound-perceiving apparatus. More severe deafness was produced by intense sounds made up largely of overtones of high pitch than by noises of lower pitch such as were heard, e.g., in cotton mills. Tinnitus was invariable, but vertigo was only present in direct proportion to the loss of perception of the upper tone limit.

Surgeon-Commander S. W. Grimwade, R.N., said that with the exception of diseases of the ear, occupational diseases of the ear, nose, and throat were not at all common in the Royal Navy. During nearly

two years' service at the R.N. Hospital, Plymouth, he had seen only four cases of labyrinth concussion from gunnery practices; all of these showed a very marked degree of deafness, which, however, was temporary, and they soon returned to normal. 99 per cent. of all cases of deafness in the navy were due to suppuration of the middle ear, and there was no question that more careful examination of recruits would eliminate a large number of these cases.

Wing-Commander D. Ranken, R.A.F.M.S., said that they found in the Royal Air Force that the effects of nasal obstruction, though disagreeable enough on the ground, were intensified in the air; the engorged nasal mucous membrane associated with high altitude frequently gave rise to insufficient ventilation and drainage of the frontal sinuses, and pilots often complained of headaches of varying duration during or immediately after descent. More important still was the presence or absence of Eustachian obstruction, for if equalisation of the pressures on either side of the ear drums by means of swallowing or auto-inflation could not be made during a rapid descent, pain and deafness together might occur, with such effects of labyrinthine disturbance as vertigo, nausea, or even fainting. There were two methods of preventing aeroplane deafness: harmful sound waves were cut off at their source by fitting silencers to the engines, and the persons exposed to noise were protected by ear protectors on the principle of a "baffle" system.

Major T. Jefferson Faulder, R.A.M.C., T.F., said that, showing the magnitude of the problem, the total number of first awards of war pensions for various aural disabilities had been 31,750; in December, 1924, this had diminished to 18,500, and approximately one-half of this total was assessed at 20 per cent. or less disablement. During the war admissions to hospital on account of ear conditions amounted to a total of 182,440, diseases of the nose 37,520, diseases of the respiratory organs other than tuberculosis 801,840, tonsillitis and sore-throat 441,040. As regards the question of ruptured drum-head, various opinions had been given, usually, in his own opinion, in the direction of over-estimation.

Mr. E. B. Waggett considered that the statistics of the recent war gave a wholly misleading impression, and he believed that the very heavy figures concerning hospital entries of chronic otorrhœa, aural, nasal, and throat operations, were to be explained on psychological rather than surgical grounds—chronic otorrhœa formed a convenient excuse for the soldier desiring a holiday at the base.

Dr. T. Ritchie Rodger (Hull) said that the sounds prevailing in boiler-making works were comparatively low in the scale, ranging round about 400 and 500 double vibrations per second. In regard to the occupational deafness of boiler-makers the mass of evidence was that the injury to the cochlea was conveyed by air-conduction, not by bone-conduction; middle-ear defects had no part in the causation. Meatal plugs of wax or vaselined wool were the only aids to prevention of the disability.

Mr. T. B. Jobson (Guildford) said that in 1915 he had had the opportunity of examining 50 German soldiers shortly after their exposure to prolonged gunfire, and about 80 per cent. of them showed diminution of acuity of hearing both for air- and bone-conduction. In from three to six months almost all of the cases had returned to normal.

In the afternoon Dr. P. Watson-Williams gave a demonstration of his method of making a complete investigation of the nasal accessory sinuses.

SECTION OF THERAPEUTICS.

WEDNESDAY, JULY 22ND.

Treatment of Asthma.

This Section met on three days, under the presidency of Prof. R. B. Wild.

Dr. W. Langdon Brown (London), in opening a discussion on this subject, said that the treatment of asthma summarised in itself, as it were, the chief trends of modern therapy: Psychotherapy, sensitive-

ness to foreign proteins, vagotonia, and endocrine balance. Successful treatment involved them all. Asthma was due to an unstable or irritable condition of the bronchomotor and vasomotor portions of the vagus nucleus, which caused it to react unduly to psychical or peripheral stimuli, or to foreign proteins in the circulating blood. The influence of the parasympathetic nervous system was also extremely important in asthma. The asthmatic, he said, was liable to other manifestations of vagotonia. It might, however, be that the vagotonia was due to a diminished action of the antagonising sympathetic nervous system. The sympathetic nerves activated those endocrine glands which released sugar into the blood, and in asthma the blood-sugar was below normal. The secretions of glands which coöperated with the sympathetic nervous system—the adrenals, pituitary, and thyroid—were generally effective in checking a paroxysm. Further, the liability of asthma to come on during sleep, when the parasympathetic nerves had the upper hand, pointed to a disturbed balance between the two great branches of the visceral nervous system. In general terms it would appear that when the endocrine balance swayed in the direction of the vagus, asthma was likely to occur in susceptible subjects; when the balance was redressed in favour of the sympathetic system attacks might be cut short or prevented.

In considering treatment, the suggestibility of the patient should be utilised to help him to expect a cure. Sources of peripheral irritation must be eliminated, including late suppers and cold bedrooms. Specific desensitisation presented considerable difficulties both because the actual cause could not always be found by skin tests and because hypersensitiveness was not always constant for one subject but might affect a whole group. Non-specific treatment might, however, be successful. The effect of climate was well known to be capricious, but at altitudes above 4500 feet attacks were very rare. Oxygen inhalations might act in the same way as pure or filtered air. Drugs which paralysed the parasympathetic endings or stimulated the sympathetic were also helpful.

Dr. E. P. Poulton (London) said that, defining asthma as a bronchial spasm with vasomotor turgescence, there were several causes of the condition. Asthma due to bronchitis or nasal coryza should be sharply separated from the idiopathic variety or allergy. The cardiac asthma of elderly patients was also a separate entity. The allergic group included other toxic idiopathies besides asthma. Skin reactions were of no value in diagnosing the cause of asthmatic attacks, but Loewe's extract of human dandruff might be of great use in determining whether a patient belonged to the allergic or to some other type. Asthma, in his opinion, was not due to anaphylaxis any more than histamine shock was due to anaphylaxis. Treatment might be directed towards: (1) Desensitising the patient either by specific or non-specific means; (2) keeping him away from the specific exciting substance; (3) acting on the receiving mucous membrane of the nose, as by light cauterisation; (4) altering the condition of the bronchial muscle and removing spasm by subcutaneous adrenalin or caffeine or by oxygen inhalation.

Dr. P. Hamill (London) said that it was wise to take a careful history and to consult the patient as to the cause of the attack. It was generally possible in this way to get at the exciting factor. He agreed with the previous speaker that it was difficult to achieve specific immunity, but non-specific immunisation might be tried. Peptones could be given by mouth for the purpose. Cases with a *M. catarrhalis* infection benefited by autogenous vaccines; but it was necessary to start with a very small dose as the patient was highly sensitive. Many drugs could be employed. The vagus endings could be paralysed by atropine or hyoscyne, the sympathetic stimulated by adrenalin and cocaine; the bronchial muscle could be relaxed by nitrites, papaverine, or benzyl benzoate. Pituitrin and adrenalin were very effective in cutting short an attack if given at the beginning. Oxygen was useful

if given efficiently, and some of the patients suffered from chronic oxygen lack. It was necessary to improve the general health and resistance and treat the patient as well as the disease. Arsenic, bromides, iodides, and thyroid were all useful.

Dr. Alexander Francis (London) said that the indiscriminate use of cautery to the nose did much damage. He gently touched certain spots on the mucosa keeping a careful watch on the blood pressure meantime. This was effective in 80 per cent. of cases, excluding those with nasal polyp. Cases complicated by nasal polyps were invariably made worse if cauterised or if the polyps were removed.

Dr. A. F. Hurst (London) said that, speaking as a sufferer for 30 years from asthma, he believed there was no cure for the condition, the patient always remaining a potential asthmatic. To ward off attacks adrenalin was invaluable if properly used. It must be given at the very beginning of an attack, when 1 minim would suffice. More than 3 minims was never required at this stage. He recommended that the patient should have an injection ready by his bedside so that he could give himself the drug the moment he felt the premonitory symptoms. The injection could be repeated as often as was necessary. If these instructions were carried out the patient need never lose a night's rest, and the fatigue which rendered him liable to further bouts was avoided. In fact, the best cure for asthma was not to have attacks.

Mr. Frank Coke (London), in spite of the dicta of previous speakers, believed in the efficacy of protein tests. He classified the types of asthma. Every single case must be fully and properly tested with every protein with which the patient comes in contact. The offending proteins must be avoided. If this is impossible, as in the case of horse dander, pollen, and proteins causing occupational asthma, the patient must be desensitised.

Dr. S. D. Bhabha (London) described an apparatus for administering oxygen which had been found successful in the treatment of asthma, and the President of the Section drew attention to the relation between asthma and eczema. The two conditions sometimes alternated in the same patient.

Dr. Langdon Brown, in replying to the discussion, agreed with Dr. Poulton's use of the term allergy. He thought that the value of skin tests was general rather than specific, and that they succeeded best when the cause of the asthma was already known. In reply to Dr. Hamill, he said that in his experience the action of amyl nitrite was somewhat uncertain. He had sometimes had great success with papaverine. He agreed with Dr. Francis as to the beneficial results of light cauterisation. With regard to the President's remark on the connexion between eczema or asthma, he showed the pedigree of a family in which the two diseases had appeared alternately in the different generations.

THURSDAY, JULY 23RD.

Treatment of Chronic Arthritis.

In opening a discussion on this subject, Sir Thomas Horder (London) laid stress on the usefulness of weighing the ætiological factors in each case. Although these were frequently obscure, there was good reason for thinking that a microbic factor was invariably present. A table to show the relative importance of this factor might be constructed as follows:—

INFECTIVE FACTOR		Joint Disease.
HIGH.	↑	Gonorrhœal rheumatism.
		Chronic pyæmia.
		Arthritis due to streptococcal, pneumococcal, dysenteric, and coliform infections.
		Tuberculous and syphilitic arthritis.
	↓	Arthritis in association with focal sepsis.
		"Rheumatoid" arthritis.
		Osteo-arthritis.
		Gout.
V	↓	Arthritis in tabes, syringo-myelia, hemiplegia, and paralysis agitans.
INFECTIVE FACTOR LOW.		Trauma.

Arthritis as a definite expression of *focal sepsis* formed an intermediate group between the cases of direct joint infection and those termed "rheumatoid," which, owing to our present ignorance of the degree to which the element of infection was present, formed the crux of the therapeutic problem. In this intermediate group drainage or other appropriate treatment of the area of focal infection was the first step in treatment. More than one area was sometimes involved, in which case it was important to determine as far as possible which was primary—and attend to that first. Where teeth and tonsils, or teeth and gastro-intestinal tract, were both involved the teeth should receive attention first. The speaker discussed the rôle of the prostate, the uterus, and the alimentary tract in arthritis. Streptococci, both hæmolytic and non-hæmolytic, were probably by far the most common organisms concerned. Antigen therapy must be supplementary to drainage of the infected area and not a substitute for it. A diet which lowered the bacterial content and caused mechanical cleansing was probably more important than the use of intestinal antiseptics; but amongst these calomel and salol must not be forgotten.

In the great majority of cases, the speaker said, chronic arthritis was part of a general disease, for which the patient required treatment. The nutritional and the nervous aspects must both be carefully considered. Endocrine disturbance was frequently present, and small doses of thyroid were often helpful. The possibility of a metabolic factor, such as gout, must not be forgotten even in cases of marked infection. Protein-shock therapy gave relief in suitable cases, but the final results were not always favourable. It was definitely contra-indicated in active disease, or where there were visceral or serous membrane complications, such as pleurisy, "stagnant" cases should be chosen; and there was grave danger in teaching students to use methods which may easily be misapplied. It was sometimes said that the infectivity of most cases of chronic arthritis made the idea of spa treatment irrational; but if arthritis was a general as well as a local disease this reasoning was fallacious. There was undoubtedly as great a field for the treatment of these cases by spa measures as ever, and of radium waters and radio-active mud we were only now beginning to learn the potentialities. Sir Thomas Horder then went on to describe the local measures available. All efforts to restore and improve the function of diseased joints reacted beneficially on the general condition, and local treatment must prepare the limbs for an arrest of the disease which might occur at any moment.

Dr. Preston King (Bath) spoke on the balneological aspect of treatment of chronic arthritis. He thought that the value of spa treatment was generally acknowledged, and that the value of the Bath Spa was a very high one owing to the thermal character of its waters which rise at a temperature of 117° F. There were, of course, many factors producing beneficial reactions in patients, and the sceptical emphasised the factor of suggestion. Suggestion did play a part, but it was nothing new: it was as old as the practice of medicine itself. He referred to the different types of arthritic disease and their reaction to balneological treatment. In his experience the asthenic case of rheumatoid arthritis with rapid pulse, emaciation, sweating, and peri-articular swellings did not respond well to full bath treatments. Such cases were apt to do badly anywhere under any treatment, but tonic treatment with douching was the most suitable. Chronic arthritis in all forms was amenable to hydrotherapy. Treatment was directed to: (1) the relief of pain; (2) the removal of sources of infection; and (3) increasing the mobility and correcting the deformity of the joints.

Dr. Nathan Mutch (London) agreed with the remarks of the opener on the importance of the drainage of any area of focal sepsis which could be discovered; but the removal of foci of infection often proved a failure as regards improvement of the patient's condition. This might be because, although

the original focus had been cleared out, the infection had already spread far beyond reach and escaped detection. A frequent source of infection was oral sepsis, and years after this had been eradicated, pathogenic streptococci of oral origin might be recovered from the stools. If the bacteriological content of the bowel at different levels was studied at laparotomy, it was often found that the ileo-caecal region was especially heavily infected, and an infection might be found above this level in the jejunum or even in the duodenum. Positive cultures might also be obtained in the lymph glands draining the bowel, indicating a widespread infection passing to the blood-stream and the lymphatics. It was not, he thought, generally realised what an enormous daily variation occurred in the bacterial content of the stools. The number of streptococci present might vary from nil up to ten times that of the *B. coli* present in different specimens, or even in different parts of the same specimen. Five to six specimens at least should be examined before giving an opinion in a difficult case. This variation should be taken into account in judging the results of drug treatments, and would also help to explain the want of uniformity in laboratory reports complained of by the opener. With regard to vaccine treatment, it was advisable before beginning this to consider the degree of toxæmia present. The reaction to vaccines varied with the activity of the toxic conditions, and this should, if possible, be reduced first. Lesions of joints and affections of the endocrine glands were often coincident. The thyroid more especially was frequently affected, and the giving of thyroid extract might assist other lines of treatment. Secondary infections and invasions often occurred. One organism might be followed by another. Joint reactions might be obtained by the injection of intestinal streptococci, when the original infection was known to have been a staphylococcus or a virulent streptococcus from the mouth. Organisms were not the cause of arthritis. Probably there was no one cause, and multiple causes should be looked for in all cases.

Dr. C. B. Heald (London) contributed to the discussion from the point of view of the cases as treated in an electrical department. He considered that they might be classified from their reaction to treatment as: (1) The stationary group, composed of those who are relieved of their symptoms so long as they continue under treatment and relapsing as soon as treatment is stopped; (2) the progressively improving group, which responds satisfactorily; and (3) the group that shows no reaction and is unrelieved or gets steadily worse. He found that cases were curiously selective in their reaction to electrical treatment; and as regards the form of treatment to which they responded, he was unable to distinguish clinically into which of the three groups a case would eventually fall. He thought that the reaction to treatment might vary with the basic variation of physical type. When studying variations of defective physical types in men presenting themselves for pilots in the Air Force, he had found that they might in general be placed in three classes: cardio-vascular debility, nervous debility, malnutritional debility. Before commencing treatment it was exceedingly important to take a careful history and to make a complete routine examination. Among other methods he always examined for areas of hyperalgesia by means of a small faradic current. The presence of positive zones was not diagnostic, but if they were present the patient was likely to show a bad reaction to treatment. Treatment was directed towards improving the basic condition and the local condition. For the nervous debility type of patient he used ultra-violet light with selected local treatments. For the cardio-vascular debility type he used diathermy, especially applied to the abdomen.

Mr. E. Watson-Williams (Bristol) thought that the importance of infections of the upper air passages should be realised and the sinuses carefully examined in every case. Although the gastro-intestinal tract might seem to be the primary source of an infection, this originated in many cases in the upper air tracts and the organisms

had passed downwards through the stomach at some period when the hydrochloric acid was diminished. Therefore sinus infections should be eliminated first in all cases. Neurasthenic conditions, too, might be kept up by the presence of chronic infections, and even crippled patients might be improved by the discovery and removal of a sinus infection.

Dr. E. P. Cumberbatch (London) stated that he was a believer in the value of electrical methods of treatment, and especially in the use of diathermy in the treatment of gonococcal arthritis. If there were no gross changes the use of diathermy would cure, and in any case it would give improvement. The treatment was applied to the seminal vesicles or to the cervix uteri, and needed to be very carefully directed both as to dosage and details of administration. In non-gonococcal cases in women there was frequently an infection of the cervix, with endocervicitis and erosion. The organisms obtained in such cases might be coliform organisms, diphtheroid organisms, or a *Streptococcus faecalis*. These, too, he treated with diathermy, with the result that in many cases the arthritis was arrested, there was an improvement in the general health, and the cervix was restored to a normal appearance. He raised the cervix to a temperature of 114° F., but not exceeding 115°. He standardised the temperature by application to the urethra, which was sensitive to heat, whereas the cervix was not.

Dr. David Campbell thought that rheumatoid arthritis presented two problems—the orthopaedic problem and that of the cure of the infective process. He thought that there was great danger in immobilising the joint. In cases of the infective type of rheumatoid arthritis protein-shock therapy was worth trying. He had not observed any case of pleurisy following the use of typhoid vaccine, which was the one he had used; but he had seen two patients who, having had albuminuria previous to the injection, had developed a transient hæmaturia.

The President remarked upon the curious fact that the onset of damp weather should cause changes of a sensitive nature in joints which are themselves continually bathed in fluid. It appeared that when the humidity reached a certain point the elimination of carbonic acid from the body was much diminished, and it was possible that one might find in the accumulation of carbonic acid an explanation of these obscure pains.

Dr. P. Hamill thought that whilst harm could be done by too rigid splinting, one of the first principles of treatment of acute inflammation was rest, and therefore he remained unrepentant concerning his use of splints in moderation, though exercise and massage should certainly be employed in addition.

Dr. Warren Crowe (Harrogate) said that in arthritis and non-articular rheumatism (for the two conditions could be classed together) vaccines ought to do well. Every active case of chronic arthritis under vaccine treatment, almost without exception, passed through a stage of sensitiveness to vaccine, and this was sometimes so intense that vaccines were for a time not tolerated at all. When the clinician recognised this fundamental fact his results would be very much better.

Dr. F. G. Thomson (Bath) said that much depended on the general condition of the patient. If the general condition was poor the best course was to send the patient to a spa. If the general condition was good the most valuable thing for practical purposes was to use intravenous shock.

Sir Thomas Horder, in replying, said that he had not intended by any means to impugn the value of the work of the bacteriologist. He could not get along without him, but he thought it desirable to ginger him up occasionally. He wanted to make it plain that he did not advise protein shock in the case of a patient who was improving by any other method. To come back to his main thesis, which he thought the discussion had strengthened, he held that arthritis was a general disease with local manifestations, and for that reason the patient must be studied quite as much as the joints.

FRIDAY, JULY 24TH.

Therapeutic Value of Light.

At this meeting of the Section, Prof. W. E. Dixon (Cambridge) in opening the discussion, said that the subject was the therapeutic value of light. It had nothing to do with X rays or radium. The actions of light which could be easily demonstrated on animals or man were of three varieties: local, general, and specific. The local and general reactions might be produced by certain other irritants. The specific action was possessed, as far as was known, only by light. The local effect consisted of erythema, which might be followed by swelling of the skin, blisters, or even breaking down of the skin. Mustard had a similar action. The mechanism was an irritation of sensory nerves which, by means of an axon-reflex, produced dilatation of the blood-vessels in the skin or subcutaneous tissues. The proof of this was that if the nerve was cut or anaesthetised the reaction no longer occurred. For instance, if a drop of mustard solution was put into the eye of an animal, the result was acute inflammation of the conjunctiva, but if the eye had been previously anaesthetised with cocaine, inflammation did not occur. Although the mechanism could be explained, the problem was not quite so simple as it appeared. How was it that both mustard and light could stimulate nerve-endings? The stimulation was brought about in different ways. Mustard underwent hydrolysis in contact with the skin. Energy was thus liberated for the stimulation of the nerve-endings. It was not known how light excited nerve-endings without affecting other tissues, but it was probably due to the presence of fluorescent substances in the skin. If these substances were exposed to light their action was greatly enhanced. One such fluorescent substance was hæmatoporphyrin, obtained during the breakdown of hæmoglobin to bilirubin. People with excess of hæmatoporphyrin were sensitive to light. This could be proved experimentally by injecting mice with hæmatoporphyrin. When the mice were exposed to light the skin became red and swollen and the animals might die. Summer prurigo and hydroa vacciniforme were a result of excess of hæmatoporphyrin in the skin in man.

Pigmentation was another non-specific local effect. It was a protective mechanism the object of which was to absorb ultra-violet light. The general effects of light were a mild stimulation of medullary centres, slight increase of the pulse-rate, with vaso-constriction and rise in blood pressure, and stimulation of respiration. There was an increased activity of the tissues, as shown by the increased power of phagocytosis of the leucocytes. The specific effect of light was its influence on the storage of calcium and phosphate in the body. The ingestion of calcium by the mouth did not alter the percentage of the salt in the tissues any more than drinking water diluted the blood. Children could be prevented from getting rickets or cured of the disease by light. The point to discover was whether light acted on the surrounding air, on the food, or on the body. It had no effect on the air, but its effect on foodstuffs and on the body was important. Wheat, biscuits, flour, milk, eggs, lard, linseed oil, cotton-seed oil, and other substances which of themselves were incapable of influencing rickets, when irradiated assumed antirachitic properties. All these foods contained cholesterol. Cholesterol underwent changes on exposure to light. It became yellower and more translucent. This altered cholesterol had the property of preventing rickets. The skin contained a large amount of cholesterol and therefore exposure to light had the same effect as feeding with irradiated cholesterol-containing foods. Experiments on rats showed that feeding with skin had no effect in curing rickets, but the animals were cured when they were given skin which had been exposed to light. Too long exposure to light was harmful. In Sweden it had been found that certain groups of people, notably neurotic patients, were made worse by light treatment. If the observations made on cholesterol held good, there should be parallelism between the incidence of rickets

and the amount of available sunshine. There were no good statistics on this point, but the information he had did not show any such relation. In the Panama zone there was little sunshine but no rickets. In the State of New York there was more sunshine but rickets was prevalent.

Dr. C. E. M. Jones (Alton) said that clinical phenomena could not always be explained scientifically. The two diseases in which light treatment had been found most effective were rickets and tuberculosis. From the clinical point of view the general action of light was more important than the local. Heliotherapy or natural sunlight aimed at producing a feeling of exhilaration and increased well-being in the patient. Certain patients could not be exposed to light and were known as non-pigmenters. They were, as a rule, fair or sandy haired, freckled people who got burnt instead of becoming pigmented. Pigmenters had a higher resistance to non-pulmonary tuberculosis than non-pigmenters. The feeling of exhilaration after heliotherapy was accompanied by increased metabolic activity. The latter might be attributed to exposure to the air and apparently did not occur with artificial light treatment, which was carried out in a room. We were familiar with psychological action of light in increasing cheerfulness. Increase of mental activity had been observed in children treated by light. Exposure to light must be graduated, otherwise depression and collapse supervened as happened with non-pigmenters. If a child who was a non-pigmenter had bone or joint tuberculosis and the lesion became quiescent it would almost certainly relapse or the child would get a fresh lesion. If the fresh lesion was treated often pigmentation supervened, and then the disease might be cured. If the patient did not have some power of acquiring pigmentation he appeared unable to shake off the infection. The effect of air and light on muscular wasting was remarkable. In cases such as those of tuberculosis of the hip, which in hospital always presented wasting of the muscle, there was practically none with treatment by heliotherapy, although the limb was immobilised in the same way. Artificial light was useful when sunlight was not available. Here the local action was much more important, but the best effects were obtained when local was combined with general light baths. He had obtained good results in the treatment of lupus. Light treatment was contra-indicated in non-pigmenters, febrile cases, in those who were acutely ill, in amyloid disease, and in the very young or the very old.

Dr. G. H. Lancashire (Manchester) said that great advances had been made in recent years in the treatment of skin diseases. He was one of the first people in this country to use Finsen's lamp, and had obtained very good results with it in lupus. Recently at Manchester they had installed a modern artificial light apparatus which was reserved for tuberculous cases. The results, especially in lupus, had been more successful than he had dared anticipate. The patients were given a general exposure to the light with the lesion covered. The cosmetic results were very good. Healing had been obtained in cases of buccal and nasal lupus. He had seen remarkable benefit from light treatment in alopecia, but he would like to utter a warning against making too wide a claim for the method. Light therapy should be reserved for cases where it gave better results than other forms of treatment. Evidence as to its special efficacy should be published before it was recommended in any particular skin disease.

Dr. William Mitchell (Bradford) spoke of his work at the Bradford Royal Infirmary, where he had treated cases since 1906. The chief conditions for which he employed light therapy were lupus, alopecia areata, tinea, acne, and lupus erythematosus. In lupus vulgaris a preliminary dose of X rays was of advantage. Cases of tuberculosis of the spine and glands did well provided that no abscesses had formed. Their presence was a contra-indication to the treatment. In lupus erythematosus better results were generally obtained with carbon dioxide snow and ether; but in some cases light was useful. For acne he preferred filtered X rays

Dr. P. Heffernan (Buxton) asked whether any work had been done on the influence of light on iodine metabolism. Dwellers in dark and narrow valleys were liable to develop goitre due to iodine starvation. He would like to know whether sunlight had any power of fixing iodine in plants or of enabling the body tissues to make use of iodine.

Dr. J. R. Garrood (Huntingdon) suggested that the factor responsible for pigmentation or non-pigmentation might be racial. Mediterranean blood was widely prevalent in this country, and the Mediterranean type survived exposure to tuberculous infection better than the Nordic.

Dr. E. P. Cumberbatch asked to what depth the arterioles were affected as the result of an axon-reflex from stimulation of cutaneous nerves. He would also like to know whether it made any difference to the clinical results whether the patient was exposed for three minutes to a mercury lamp or for half an hour to a carbon lamp.

Dr. Newman Neild (Bristol) said that patients were apt to take the cure into their own hands with disastrous results. He had two cases of phthisis who had exposed their chest to the sun without medical advice and a bout of pyrexia had followed.

Dr. Helen Mackay (London) said that her experience had differed somewhat from that of other speakers. Neurotic children suffering from irritability did well under light treatment. They became much happier. In babies if the dose was increased too rapidly the child remained happy but stayed awake. If the dose was cut down the child immediately slept well. Moderate stimulation was good, but an overdose caused undue excitability and must be avoided. Cases of eczema benefited when light was added to local treatment. She had had good results with wasting babies, but it was extremely difficult to foretell which children were going to do well with light.

Dr. J. M. H. Munro (Bath) called attention to the analogies between tuberculosis and rheumatoid arthritis. In both treatment aimed at raising the metabolism generally. To this he attributed the good results obtained in arthritis with light therapy.

Dr. T. B. Poole (Westcliff) spoke of the benefits of calcium administration in menorrhagia and chilblains, and concluded that the drug was absorbed into the circulation.

Dr. Jones, in reply to Dr. Cumberbatch, said that he had found no difference between the two methods of exposure from the clinical standpoint; but he himself preferred the carbon lamp because it more closely resembled sunlight. He did not agree with Dr. Mitchell that abscess formation contra-indicated light treatment. He had had success in a case of tuberculous spine with abscesses. As Dr. Neild had said, there was a good deal of risk in pulmonary tuberculosis from unsuitable exposure.

Reply.

Prof. Dixon, in replying to the discussion, said that clinical observations could not always be explained by science. Science was only the handmaid of medicine. He agreed that pigmentation varied with the patient's resistance. Dr. Jones's observations and Dr. Garrood's explanation were both in agreement with Charles Darwin's statement that only the people who became black were able to resist certain tropical diseases and therefore they had survived. He did not know of any work on the influence of light on iodine metabolism. The question of calcium absorption had nothing to do with this discussion on light; he would only say that, unless there was calcium starvation, taking calcium by the mouth did not increase the amount in the blood, nor did it increase the clotting power of the blood. In reply to Dr. Cumberbatch, he said that the reflex from cutaneous nerves acted on the vessels in the subcutaneous tissues down to the muscles. Dr. Mackay had spoken of overdoses of light. Stimulation was always followed by depression. Unfortunately, we had at present no means of gauging the amount of light administered.

Dr. Newman Neild read a paper on the

Uses of Posture for Bronchial Drainage.

In order to drain the bronchi, he said, the patient must be placed in such position that the bifurcation of the trachea was lower than both bronchi. There were three practicable positions in which this result might be obtained—namely, on the back, on the face, and on the side. The best and the one most comfortable to the patient was on the side but turned a little towards either the face-down or the on-the-back positions. The patient would lie on his right side, with the head low and the waist raised with pillows, so that the highest point was under the lowest ribs. The right ear would be close to the edge of the bed so that the mouth would be over the side. The position must be maintained by suitably placed pillows. This posture was excellent when prolonged drainage was required. If only one side of the chest required drainage that side should be uppermost. Cases treated successfully by the adoption of this posture included hæmoptysis, pharyngeal paralysis, bulbar palsy, cerebral disease, and various conditions complicated by bronchitis. If dying patients were placed in this position the death rattle, which is so trying to others who are in the same ward, would cease.

Reviews and Notices of Books.

THE MECHANISM AND GRAPHIC REGISTRATION OF THE HEART-BEAT.

Third edition. By Sir THOMAS LEWIS, M.D., F.R.S., &c. London: Shaw and Sons. 1925. Pp. 529. 50s.

SINCE the appearance of the last edition of this monograph the results of some important researches in cardiac physiology and therapeutics have been published in this and other countries. A mass of new evidence has been collected—a very considerable part of it in Sir Thomas Lewis's own laboratory at University College, London—and a step forward has been made in our knowledge of certain aspects of the subject. This recent work is ably summarised in the present volume. Each new hypothesis considered is submitted to the same careful and well-balanced criticism which characterised the previous edition, and when, in the author's opinion, the evidence at present available is insufficient to justify a definite conclusion, the observed facts are clearly stated, and the reader is left to form his own judgment.

One of the objects of science is to simplify knowledge by developing general hypotheses which will correlate and explain what had previously been an apparently disconnected mass of observations. In the new chapters of the present book which deal with circus movement and with the membrane theory of electrical phenomena, the reader can catch a glimpse of two mechanisms which have already shown promise of bringing together observations hitherto more or less isolated and obscure. The researches of Mines and Garrey originally suggested circus movement as the cause of fibrillation; but at the time that the second edition of "The Mechanism" went to press an alternative hypothesis received the support of the author. In the present edition five chapters are devoted to the consideration of circus movement, the refractory period, and closely allied problems; while two others deal with the possible rôle played by circus movement in the genesis of extrasystoles and paroxysmal tachycardia, and with the alternative hypothesis of parasystole. Another new chapter treats of the nature of heart-block. In addition to these major alterations and additions, much of the text has been rewritten to conform with the most recent advances in our knowledge, and many new figures have been introduced. To deal in detail with these various points is beyond the scope of a review, and it must suffice merely to enumerate as examples

the sections dealing with "the law of cardiac muscle," the relation of excitation to contraction, the membrane theory of electrical changes in muscle, and the significance of aberrant ventricular complexes.

There is one aspect of the subject which might with advantage be treated more fully in a future edition—namely, the instrumental investigation and the graphic registration of heart sounds and murmurs. The various devices employed by Einthoven and his colleagues, by H. B. Williams and by Wiggers, each have certain advantages over the older method with the carbon microphone. Year by year as specialisation increases it becomes more and more difficult for the clinician to keep in touch with the growing point of knowledge. The general physician of to-day must be content to receive most of his mental nourishment in a predigested form, but for those who still prefer to masticate their own food, and are prepared to curtail the number of courses on the menu, a book such as this is invaluable. It summarises recent work, it affords an easily accessible and very complete bibliography, and last, but not least, it gives the reader the benefit of the carefully considered opinion of an expert critic.

Sir Thomas Lewis's book holds a unique position in the literature of modern cardiology.

MANUAL OF PRACTICAL X RAY WORK.

Third edition. By JOHN MUIR, B.Sc., M.B., Ch.B., Assistant Radiologist, University College Hospital. London: William Heinemann. Pp. 524. 31s. 6d.

THIS excellent manual was first published in 1908 under the joint authorship of Dr. J. Muir and Dr. D. G. Arthur. In this third edition Dr. Muir has done the re-writing and revising in collaboration with the late Sir Archibald Reid and Mr. F. J. Harlow, of Blackburn, and no doubt the help and advice received has greatly enhanced the value of the book. The gastro-intestinal section, although not unsatisfactory, seems to be its least adequate part, and here some amplification would be useful. New methods and observations on such subjects as orthodiagraphy, pyelography, gall-stones, and eventration of the diaphragm are dealt with clearly and in sufficient detail for a text-book, while a small appendix on the radiography of the pregnant uterus is added.

Of good X ray books there are few, but this one can be recommended to the practitioner with confidence, and particularly to students who are studying for a diploma in radiology. Finally, the illustrations are sufficiently numerous, good, and clear. We have one criticism. Nearly all the modern X ray text-books are devoting more and more space to technical descriptions of X ray tubes, electrical supplies and apparatus. This seems often to be a great waste of time, space, and energy on the part of the authors. In this volume, for instance, 166 pages are given up to this technical electrical description out of a total of 524 pages, and practically all the information can be got from the excellent descriptive catalogues which are nowadays published by instrument makers. It seems that the space might be more usefully employed by a medical writer.

PATHOLOGY.

Text-book of Surgical Pathology. By C. JENNINGS MARSHALL, M.D., F.R.C.S., Assistant Surgeon to Charing Cross Hospital; and ALFRED PINEY, M.D., M.R.C.P., Director of the Institute of Pathology, Charing Cross Hospital. London: Edward Arnold and Co. 1925. Pp. 469. 21s.

ONLY occasionally does it fall to the lot of the reviewer to deal with a book for the production of which it can be truthfully said there was real need. The appearance of this volume provides one of these rare occasions. While it cannot be said that the comprehension of the pathological basis of surgery

advances at such a rate as to render the older text-books on the subject obsolete, none the less changes in thought occur and the manner of looking at things alters on small points sufficient in the mass to make a text-book, unless frequently re-edited, date very perceptibly. And of the older standard text-books of surgical pathology there have been no new editions for several years.

The present volume is all that a text-book should be. The style is clear and concise; the illustrations, with the exception of some of the reproductions of X rays and the microphotographs, are excellent; the latter are as good as pictures of their class can be, but in comparison with the histological drawings they seem to demonstrate the incapacity of the camera to reproduce successfully histological sections. In the selection of their matter the authors have shown sound judgment, not only as to inclusion and exclusion, but also in the allotment of space. Their attitude towards matters still the subject of debate is particularly laudable; in all cases where diverse views are held, the authors have never hesitated to say so, and have gone to considerable pains, succinctly but with perfect fairness, to set forth all the conflicting views worthy of consideration. In one or two instances, as in the case of the alleged relationship between "intestinal stasis" and chronic mastitis, they have gone so far in their desire to be strictly impartial as to include hypotheses hardly meriting serious consideration. It is indeed on this subject of chronic mastitis that the reader looks in vain for guidance. From the two brief pages allotted to it no idea can be gained of the multiplicity of its clinical forms or histological appearances. The section on the blood is also disappointing. It does not help to clear thinking to describe "azurophile granules" as characteristic of the monocyte. It is true that the fine granules of these cells are azurophile, but they are seldom or never seen as such by the student, while the scanty but coarse azurophile granules of the large lymphocyte must be familiar to anyone who has seen a properly stained blood film. But these are relatively small points for consideration in a future edition.

The book may confidently be recommended alike to teachers and students of surgical pathology.

Laboratory Diagnostic Methods. By JOHN A. KOLMER, Professor of Pathology and Bacteriology in the Graduate School of Medicine of the University of Pennsylvania; and FRED BOERNER, Associate in Bacteriology in the Graduate School. London and New York: D. Appleton and Co. 1925. Pp. 338. 10s. 6d.

THIS book stands out from others of its class because its originators have from start to finish written solely for those actually concerned with the technique of clinical laboratory diagnosis. No cognisance is taken of the indications for the use of the various procedures described, nor is there a word as to the interpretation of results. Thanks to this rigorous self-limitation, the authors have been able to include details of methods covering practically the whole field of bacteriology, chemistry, and immunology as applied to clinical diagnosis. Histological methods of diagnosis are not included. Procedures are clearly and concisely described, for the most part in a series of numbered steps, and the composition of all reagents mentioned is fully set forth. The book should therefore prove of great value to all actively engaged in laboratory work.

The value of the book to medical practitioners and students, to both of whom it is addressed, is more doubtful. The busy practitioner has little time for the minutiae of laboratory work. To place such a book as this in the hands of students would encourage the existing tendency to regard pathology as a short cut to diagnosis instead of the fundamental stuff of medicine. For the laboratory worker, who has presumably mastered the elements of his subject, and for the laboratory assistant to whom correct

technical performance is an end in itself, the work should prove invaluable. Many of the methods described have not hitherto been available in any text-book. An excellent feature is the inclusion of McFarland's nephelometric method for the standardisation of bacterial vaccines; this closely resembles that described in 1919 by Kirman and Brown, but has the advantage of greater simplicity. It would mark one step in the clearing of the tangled skein of vaccine therapy if some such method as this could gain universal acceptance. At present one man's million may be another's thousand so far as organisms are concerned. Given a standard nephelometric method, the user of a vaccine could be reasonably sure that his "million" always represented the same amount of bacterial substance, though the actual figures would remain as mythical as at present.

PEDIATRICS.

Handbuch der Kinderheilkunde. Third edition. Vol. IV. Edited by Prof. M. VON PFAUNDLER, Munich, and Prof. A. SCHLOSSMANN, Düsseldorf. Leipzig: F. C. W. Vogel. Pp. 789. M.45.

THE third edition of this well-known handbook is completed by the appearance of the fourth volume, which contains the index to the whole work. In the first part of the volume Prof. Noeggerath and Dr. A. Eckstein deal with the diseases of the urogenital tract and of the suprarenal glands, which are described in considerable detail, and preceded by a really useful account of the physiology and chemistry relevant to the subject. With the exception of a short chapter by Dr. J. Husler on bone and joint diseases, the remainder of the volume is devoted to neurology, and these chapters, by Prof. Ibrahim, Prof. Gött, Prof. Sage, and Dr. Mendelssohn, form one of the most comprehensive works which have appeared on this branch of children's disease. While they should be invaluable as a work of reference, their utility is of wider application. The chapter by Prof. Gött on functional nervous disease contains much that is original in its presentation, and should be read by all who are interested in this subject. One may regret the somewhat arbitrary division into separate chapters on organic and functional diseases (the latter including chorea, epilepsy, and mental defect) by different authors, but this does not detract from the excellence of the articles. The well-established reputation of this handbook will certainly be maintained by the new edition.

DIETETICS.

The Diabetic Life. By R. D. LAWRENCE, M.D., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital. London: J. and A. Churchill. 1925. Pp. 161. 7s. 6d.

THIS book has been written to meet the needs of both patient and doctor. It is quite certain that if the diabetic patient wants to keep well he must know a good deal about his disease. The book is well suited for this purpose. The elements of physiology and the symptoms of the disease are set out very clearly. The necessity of making the diet as palatable as possible is clearly recognised throughout. Provided that the patient has sufficient intelligence, he can be told to arrange his diet himself according to the number of grammes of carbohydrate, protein, and fat which are allowed him. The tables originally prepared by Drs. Harrison and Lawrence are included in the book and will enable the patient to make his own calculations. For those who are less intelligent the "line ration" scheme devised by Dr. Lawrence is simple to understand and should give sufficient variety. The different aims in treatment are briefly considered, and Dr. Lawrence does not consider that it is essential to make the patient uncomfortable in order to keep the fasting value of the blood-sugar normal. The sets of rules given for the use of insulin

and for maintaining the general health are sound, and the appendix contains useful notes on food substitutes. The index is a good one.

The book should be of use to practitioner as well as patient.

Lexikon der Ernährungskunde. By Dr. E. MAYER-HOFER and Dr. C. PIRQUET. Vienna: Julius Springer. 1924: Lief. I. Pp. 144. Sch.3.60. 1925: Lief. II. Pp. 336. Sch.11.90.

THIS work, of which the first two sections (A to G) have appeared, represents a highly original idea carried out with remarkable thoroughness. It may be described as an encyclopædia of all that appertains directly or indirectly to the feeding of man or beast. It contains articles not only on every form of food-stuff and fodder, but on many subjects, the connexion of which with nutrition appears somewhat remote. Ants, for instance, receive notice owing to the peculiar habits of certain South American tribes; an article on apes appears for a similar reason, with some comments on the ethics of this form of diet. Short biographical notices are accorded to writers on gastronomic subjects, such as Athenæus and Bergius Benegt. In the articles on the more important forms of food special attention is given to nutritive values and methods of preparation. Some of the subjects, such as diet in fever, and the arrangement of children's diets, are intimately connected with medical practice.

This lexicon contains much that is quaint and rare, as well as much that is of practical importance to-day. It should be of use and interest to students of many subjects, more particularly to physiologists and physicians.

The Normal Diet. By W. D. SANSUM, M.S., M.D., Director of the Potter Metabolic Clinic, Department of Metabolism, Santa Barbara Cottage Hospital, California. London: Henry Kimpton. 1925. Pp. 72. 6s. 6d.

THE author of this little book considers that too little attention has been paid to the bulk requirements, the mineral and water requirements, and the balancing of a diet so as to avoid acidosis, and he has dealt with these more particularly while giving a brief account of the fundamental principles concerned with caloric value, protein and vitamin contents of a normal diet. His views on bulk requirements are the most original, and he appears to hold that colitis is about the most frequent cause of abdominal discomfort which may be largely removed by correct dieting. His statements on the progress of food through the bowel are, however, not in accord with the usual teaching in this country. He states that "the food taken on any particular day furnishes the residue for the bowel movement of the third or fourth day," while Hurst has shown by means of X rays that ingested food enters the rectum within 18 hours. For the average person to secure normal bowel movements Dr. Sansum considers that two pounds of fruit and vegetables are required daily, which is certainly more than the average person normally consumes. His views on acidosis are rather curiously stated, but they do serve to bring out an original idea on the subject of what he calls "shopper's headache," which occurs in women who do a full day's shopping on an empty stomach, thereby utilising much of their own fat with a resulting acidosis.

KLINISCHE LABORATORIUMSTECHNIK.

Second and enlarged edition. Vol. II. By Prof. Dr. THEODOR BRUGSCH and Prof. Dr. ALFRED SCHITTENHELM. Berlin: Urban and Schwarzenberg. Pp. 683-1448. G.M. 21.60.

If this volume is intended for use in the clinical laboratory, as its title would lead one to suppose, the reader is tempted to speculate as to what kind of place a modern German clinical laboratory must be.

Were only a quarter of the investigations described to be employed, this laboratory could only be worked by an amalgamation of the pure chemical, physical, biological, and mathematical departments of a very well endowed university. The "clinical laboratory techniques" include, amongst many other operations, the following: A complete account of inorganic analysis, a detailed account of ultimate organic analysis by means of both micro and macro furnaces, interferometric and refractometric observations on sera; detailed accounts of the methods of setting up the Starling heart-lung preparation. And it must be fully understood that we have not gone out of our way to quote the most abstruse sections, and that the above list is merely a small sample of the varied techniques described.

For the use of the worker in a big department embracing all branches of bio-chemistry the volume has great merits. For instance, there is a very complete account of the methods for analysing blood, faeces, urine, and tissues for metals, poisons, and drugs. The section on basal metabolism and respiratory methods is very well written, and is admirably complete. As usual, the section dealing with hydrogen-ion concentrations is far superior to that in any English book, a reproach that some of our own workers should remove. Methods of blood analysis are dealt with very thoroughly, and it is a pleasure to see Folin's methods reprinted without the misprints of his original papers. The volume contains methods for estimation of anything in everything. It is a boiled-down and condensed Abderhalden's Biochemische Handlexikon, with parts of the Arbeitsmethoden thrown in, all superimposed upon a background of Neubaum-Huppert's "Analyse des Harns."

The descriptions are good and full of detail, and an attractive feature is a series of tables, giving every factor likely to be wanted in the course of arduous biochemical research.

STUDENTS' GUIDE TO OPERATIVE SURGERY.

By ALFRED T. BAZIN, D.S.O., M.D., Assistant Professor of Surgery and Clinical Surgery, McGill University. Montreal: Renouf Publishing Co. Pp. 126.

THIS small book is for the use of students whilst actually performing operations upon the cadaver. The descriptions of operations are made as short and succinct as possible. The author makes no pretence of having written a text-book on operative surgery, and the work will be a useful guide to undergraduates doing an operative surgery course and perhaps also to their teachers, as a chapter on the organisation of the class and a schedule of the suitable operations have been added.

CHEMISTRY.

A System of Physical Chemistry. Third edition. By WILLIAM C. McC. LEWIS, M.A. R.U.I., D.Sc. Liverp., F.Inst.P., Brunner Professor of Physical Chemistry in the University of Liverpool. In three volumes. Vol. III.: Quantum Theory. London: Longmans, Green and Co. Pp. 407. 15s.

THE first edition of this work was published in 1916 in two volumes. In the second edition in 1919 a third volume was added. This arrangement has been adhered to in the third edition. There are nine chapters, and a series of appendices, written by Mr. James Rice, Mr. A. McKeown, and Mr. R. O. Griffith on subjects with which they are specially conversant. The first chapter deals mainly with the theory of probability. The descriptions are admirably clear, and can be followed a priori. What is more, the mathematical parts are evolved before the readers' eyes, and no stages, however simple, are jumped. There is, perhaps, one minor point for criticism. The author explains very clearly that in

ordinary mathematical probability the factor can never exceed unity. He states, in a footnote, however, that the factor for thermodynamic probability is usually a "quantity being in general a large integral number." This must confuse the beginner, since it would seem impossible to have anything surer than a certainty, which, after all, is what is meant by a probability factor of over one. The meaning of thermodynamic probability is fully described on p. 11, where the work of Boltzmann is discussed. We feel that a reference to this page would have helped the beginner. In the succeeding chapters the theories of quanta are reviewed, and a very full account is given of Planck's radiation hypothesis. The author is to be congratulated upon the clarity of his style and the clearness of his mathematical reasonings. The appendices uphold the high standard of the general text, with the result that the whole work can be described as a brilliant exposition of an intricate subject.

A Manual of Practical Chemistry for Public Health Students. Second edition. By ALAN W. STEWART, D.Sc., A.I.C. London: John Bale, Sons and Danielsson, Ltd. Pp. 83. 5s.

THE present edition appears after a lapse of 11 years, during which time the author states that he has "gained much experience in teaching students." The truth of this statement can easily be seen from the author's clear style and excellent arrangement. The book is meant purely as a laboratory notebook of methods, and is consequently interleaved. There are six parts, the first dealing with acidimetry and alkali-metry, the second with air, and the third with water analysis. All the descriptions of techniques are complete in themselves, and, with the exception of methods of air analysis, are up to date. The author does not mention certain modern advances in gas analysis—such as Haldane's methods, or the commercial use of the katharometer. The last three sections deal with analysis of food and beverages, disinfectants, and microscopic work. A series of examination questions are appended. Although the book is so small the descriptions are adequate, and practical wisdom is manifest in the hints to students in the front of the volume. The last hint consists of the one word "think."

PATHOLOGICAL ANATOMY.

Pathologisch-Anatomische Sektionsmethode nach den Grundsätzen des pathologischen Institutes der Prager Deutschen Universität. Herausgegeben von Dr. BÉLA HALPERT, mit einem Geleitwort von Prof. Dr. A. GHON, Vorstand des Institutes. Wien: Julius Springer. Pp. 48. G.M.2.

IN this book is set forth in the briefest and most succinct manner possible the mode of procedure adopted in the performance of post-mortem examinations in the pathological department of the German University at Prague. To publish this procedure, the result of experience gained at many thousand autopsies, was distinctly a bright idea on the part of the author. The perusal of his pages in which is set forth the steady and methodical march of the investigation into the remotest recesses of the cadaver will cause many a pathologist to formulate good resolutions for the future. This is a book of a type of which, to the knowledge of the reviewer, there is no example in English. Although the procedure, modelled on that of Rokitsansky, is not that in general use in this country, it would stand imitation.

PSYCHIATRY IN PRACTICE.

La Psychiatrie en Clientèle. By Dr. RENÉ CHARON. Paris: A. Maloine et Fils. Pp. 152.

THIS small volume, one of a series dealing with various departments of medicine under the title

"Comment guérir," is more completely divested of any academic superfluities than any other similar work which has come before us. Introduced by a brief résumé of normal and abnormal psychology, it presents the whole field of insanity under broad symptomatic headings, which are subdivided in the text only to the extent necessary for preventing confusion between maladies of totally different nature and origin. Some of the effects of this policy are necessarily odd: general paralysis, for instance, is treated in the chapter on "involution disorders" (as distinct from "evolutive," due to congenital defect), as also is dementia præcox, apparently because both are dementias, and dementia is an involutory change in senile cases. The whole is written from a practical standpoint, with concise and frequent paragraphs on treatment. In addition to the usual section on medico-legal questions, there is considerable space devoted to the sociological aspects of "mental hygiene."

New Inventions.

PHILIPS "METALIX" X RAY TUBES.

ABOUT a year ago we described in these columns ¹ a new piece of X ray apparatus made by the firm of Philips, of Eindhoven, Holland, which had been in use at Dr. Bronkhorst's tuberculosis sanatorium in Apeldoorn. This apparatus, the Philips "Metalix" tube, has now been placed on the British market, and was exhibited at the International Congress of Radiology held at Westminster in July of this year, where it attracted considerable attention. The virtue of this apparatus lies in the simplicity of its manipulation and in the elimination of the danger to the operator hitherto associated with the application of X rays. The apparatus, which is made in five sizes for different types of work, consists of a cylinder varying in length from 16 to 20 in., in diameter from 2½ to 2¾ in., and in weight from 5 to 6 lb. The metal wall of the tube consists of a chromium-iron alloy capable of being readily sealed to the glass and retaining a perfect vacuum. The heat conductance of this metal is so very small that it can be made red-hot at one end without injuring the seal at the other end. An incandescent cathode filament is placed within the metal vessel which has a circular opening, at a very short distance from which an insulated electrode is mounted, serving as an anti-cathode. The electrons are drawn towards the anti-cathode through this opening. Thus a sharply-focused spot is produced, the diameter of which depends upon the size of the opening, which serves as an electron diaphragm. The X rays issue from the anti-cathode through a window at the end of the tube. The rays which do not emerge from the window are absorbed by metal protective walls of lead and brass arranged round the tube inside the chromium-iron casing; hence the tube can be used without any further protective devices. It is claimed that this type of tube, in addition to the general advantage of complete protection without external aids, also has an increased output as compared with the usual X ray tubes. The metal-encased tube has been developed in several types for various purposes, and such tubes are said to have worked perfectly satisfactorily for three years.

The "Metalix" tube was awarded the highest honours at the recent medical exhibition held in Warsaw on the occasion of the July Congress of Polish doctors.

Further particulars may be obtained from Philips Lamps, Ltd., 60, Wilson-street, Finsbury-square, London, E.C.2.

¹ THE LANCET, 1924, II., 562.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 19, 1925.

OPIUM AS AN INTERNATIONAL PROBLEM.

THE Opium Committee of the League of Nations recently concluded its discussion of the annual reports from various States. The notes published in THE LANCET from time to time¹ have shown how difficult is the problem with which this Committee is grappling. Since The Hague Convention of 1912 the control of the traffic in dangerous drugs has been a matter of anxious and prolonged discussion wherever nations have gathered in congress. The second League Conference held 28 sittings, and any definite results were prejudiced by the regrettable withdrawal of the American and Chinese delegates. Much difference of opinion now exists as to the value of the advances made. Prof. PERROT, a French delegate, writes with some satisfaction in the *Revue Scientifique* of July 11th, while Sir WILLIAM COLLINS in the August *Contemporary Review* doubts whether the proposed Permanent Central Board may not prove a means of procrastination rather than an agent for forward movement. The idea of this Central Board originated in the Opium Advisory Committee of the League of Nations, and was endorsed by the United States and Great Britain. Its principal business would be to gather information about the production of, and international traffic in, narcotics, and especially to watch the channels of illicit trade smuggling. It was intended by those who devised the idea of this Central Board that it should have very wide and drastic powers of inquisition and publicity, and it was to be in a position to ration raw material and manufactured narcotics among the nations, with strict reference to their needs and available supplies. In the preliminary discussions, the American, British, and certain other delegations sought to give this Board such powers, but the obstruction encountered was sufficient to whittle down the proposed powers to an authorisation, in the event of an excessive and unexplained accumulation of narcotics in any country, and a belief by the Board that this country was in danger of becoming a centre of illicit traffic, "to recommend that no further exports of the substances covered by the present Convention or any of them shall be made to the country concerned until the Board reports that it is satisfied as to the situation in that country." The Board would also be authorised to publish a report in any such situation; and the Convention also declares it to be the friendly right of any country party to the agreement to draw the attention of the Board to any matter which appears to it to require investigation.

Writing in the September number of the *World's Health*, the journal of the League of Red Cross Societies, Mr. JOHN PALMER GAVIT, who until recently was managing editor of the *New York Evening Post*, and was a close observer of the conflict of interests in the winter of 1924-25, attaches considerable importance to this Board. He hopes that the Governments concerned will ratify the Convention, but a reply in the House of Commons on June 17th last indicated

that no ratifications had so far been deposited. Mr. GAVIT believes that, given the will and the necessary powers, the production of manufactured narcotics can be controlled. There is only one place where this can be done, and that is the place whence every ounce of morphine, heroin, and cocaine must emerge at the outset of its search for victims—namely, the factory. Drug factories are relatively few, and the Governments know exactly where to find them. The character of the problem has, he contends, changed greatly since international agreement was first registered in 1912. The evil is not now an exotic affair of the Far East—the eating, drinking, and smoking of raw and prepared opium are injurious enough, but they are surpassed by the present-day abuse of the derivatives of opium and other highly concentrated drugs of addiction. These, being less bulky and more easily disguised, are more profitable to smuggle. Also, they have behind them the push of the Western genius for business organisation, and the subtle effect upon conscience of absentee ownership. It is not generally realised that, since the Hague Convention and during and after the World War, the situation has developed with appalling swiftness. The old enemy, opium, in a new and immensely more venomous and devastating form, with new allies and in overwhelming quantities, has become a very real menace to civilisation. Mr. GAVIT gives some interesting and disquieting figures. It will be remembered that the Health Commission of the League of Nations, the Opium Advisory Committee, and a mixed subcommittee representing both gave an estimate showing the amount of raw opium and crude cocaine needed per capita per annum for medical and scientific use by the population of the world within reach of modern medical service. This amount was 450 mg. of raw opium and 7 mg. of cocaine. On the basis of an estimated 744,000,000 (of the world's assumed total population of 1,747,000,000) as the population represented in the phrase "medical and scientific needs," the total legitimate needs of the world work out in tons as follows: 100 for medicinal opium, 136 for morphine, 84 for codein, and 15 for heroin—a total of 335 tons. After bringing up this total to 340 tons by allowing for such of the natives of Asia and Africa as might get access to doctors, Mr. GAVIT writes: "But let us 'go the limit' and allow 450 mg. of raw opium a year for every man, woman, and child in the world. That will give us the outside total as the conceivable medical and scientific needs of the whole world of 786 tons of raw opium per year." What is the actual amount of opium produced? No one knows. But conservative estimates converge with remarkable closeness towards a total production of about 8600 tons, including 5000 tons attributed to China. In other words, less than one-tenth of the total amount of opium produced is for legitimate medical and scientific purposes. Still less is known about the output of cocaine, of which only little more than 5 tons a year would be needed for the 744,000,000 of the population of the world supposed to be within reach of modern medical service. But a clue can be given to the liberality of the supply actually available by the fact that Japan alone in 1922-23 manufactured 15,432 lb. (*Times*, August 27th). It is evident, therefore, that the production of narcotics in the world is at least ten times as great as the most extravagant estimate of its legitimate needs.

While we wait for the efficient Government control of the drugs of addiction, it is to be hoped that voluntary associations, such as the national Red Cross Societies, may take up the educational side of

¹ THE LANCET, 1925, i., 878.

the problem, teaching the public the nature and the immensity of the narcotic peril. Such a campaign would not only educate the public, but would also probably convert some of the static power of Governments into kinetic energy.

THE METROPOLITAN ASYLUMS BOARD.¹

THE annual report of the Metropolitan Asylums Board, which has just appeared, contains, as usual, a large amount of well-arranged information concerning the treatment of infectious diseases in the important area of its work, and it is to this section that the main attention, both of the medical profession and of the public, will be paid. The responsibilities of the Board, however—and it is sometimes forgotten—are of a much wider range than this section indicates. If we include the work in tuberculosis done by the Board under the heading of the care of infectious diseases, there still remain some six other principal directions in which services are discharged which are invaluable to the public; for the duties of the Board include the management of hospitals and institutions for children suffering from specified contagious diseases as well as for those requiring special treatment in hospitals or convalescent homes; the provision for certain classes of mental defectives and epileptics; the care of Poor-law lads in training for the sea, both for the Navy and the mercantile marine; while a certain proportion of the casual poor fall under their jurisdiction as an authority which was instituted more than half a century ago by an order of the then Poor-law Board. Arrangements have been made only this week with the Ministry of Health, under which cases of puerperal fever to be referred to the Board are to be grouped in certain hospitals for special care and study. The Board also furnishes London with ambulances. Under these headings this report makes a clear statement of work done and results obtained, and it is possible that the figures in connexion with the last-named activity will be a surprise to many, having regard to the frequent complaint that the metropolis is lacking in proper facilities for the transport of the sick. The ambulance service, by land and river, of the Board during the year in question, dealt with over 72,000 removals, an increase on the previous year of 10,000, while the distance covered in the combined journeys amounts to a total mileage of 725,000 miles, being an increase of about 40 per cent. over the mileage of the previous year. This increase is indicative of a growing practice on the part of the medical profession and the general public to employ the ambulances of the Board in lieu of less specialised means of transport for the conveyance of patients and invalids over considerable distances. This willingness to use the ambulances of the Board accentuates the fact that public comments on the dearth of ambulances in London nearly always have the same origin; they are aroused by some default in dealing with cases of accident in the street. The whole of this question has been under anxious consideration for some time, and was referred by the Minister of Health over two years ago to the Voluntary Hospitals Commission, when a conference was held on the position of ambulance services generally in the metropolitan area. The need for better organisation and supply of transport of the

sick should be better met, and it is to be hoped that action is approaching.

The section dealing with infectious diseases leaves a rather mixed impression of satisfaction and the reverse, when we study the record of progressive work in the metropolis to provide for the treatment of the epidemic group. The story of scarlet fever is a cheerful one; it can be seen from the figures that the disease can now be regarded as one which is normally unlikely to end fatally, the case-mortality is considerably under half what it was 30 years ago, while the notifications are less, though the average population of the area concerned is greater by some 80,000 persons. Measles must always be a difficult disease to summarise in statistical terms, because of its sudden incidence in large epidemics and their rapid cessation. Further, the Board deals only with a proportion of the cases, as accommodation for measles is found elsewhere during the early stage of an outbreak, the demand for hospital treatment only occurring after a certain limit has been reached. Therefore an epidemic may make grave demands on the accommodation of the Board suddenly, which demand declines with proportionate rapidity. Reference to the statistical table supplied in this report will show how the help of the Board is sought with increasing urgency for brief periods, during epidemics of measles, and how promptly the need for assistance dies away. The figures for small-pox are satisfactory, the past year being the twenty-third in succession since the disease has secured any firm hold throughout the metropolitan area. A brief history of small-pox in London, so far as the activities of the Board have been concerned, is included in an appendix, and would make salutary reading at the present moment for a good many persons. The references to encephalitis lethargica are significant, and are supported by a note on the arrangements which have been secured for the treatment of cases, written by Dr. GORDON PUGH, chief medical officer of the Children's Service of the Board. The note shows that the need for institutional treatment in juvenile cases of encephalitis lethargica is great and may be increasing in urgency, having regard alike to the recent extension of the disease in London, the non-existence of facilities for dealing with the cases, and the special difficulties incidental to the mentality of patients in the later stages. During the second quarter of 1924 there was a high notification rate of the disease, 391 cases out of 611 occurring during that quarter, while it is now recognised that, quite apart from its intrinsic seriousness, apparent cure of the disease is frequently followed by obscure after-effects, developing into physical, and especially psychical, disturbances of an anxious nature. Abnormalities of conduct have been observed which might bring, and which possibly have brought, patients within the sphere of the criminal law, when their actions have been dictated by the remaining influences of the disease, and this is a state of affairs to the remedy of which attention should be directed at once.

We refer, finally, to the anxious position revealed by the figures in relation to diphtheria, whose prevalence is sometimes regarded with complacency because the antitoxin treatment, devised 30 years ago, produced such wonderfully favourable results. But steady though the progress, which can be recorded, may have been in the treatment of diphtheria, it has been too slow, for the figures show that, in London at any rate, the forces of the disease have latterly been gathering power. Compared with the septennial period 1897-1903, the septennial period 1918-1924, gives only superficially the idea of any progress at

¹ Annual Report of the Metropolitan Asylums Board, 1924-25. Pp. 364. Office of the Board. 5s.

all, and none whatever is claimed in the report. The number of notifications, though higher in the latter of these periods, is not out of proportion to the increase which has taken place in the average population, and the death-rate per cent. is in the same period only still what it was in the earlier period. But in the intermediate 14 years the notifications were much less numerous, while figures indicating the seven year rate per 1000 persons living are considerably higher for the last septennial period than for the two preceding periods. The statistics and the words of the Board alike show that the offensive power of diphtheria is increasing in greater ratio than the defence, and it would seem that we have been lulled into inactivity by the gratifying experiences which followed the introduction of the antitoxin treatment. The fact that the position to-day is infinitely better in respect of diphtheria than it was 30 years ago is a legitimate source of satisfaction. In the matter of case-mortality a steadily declining rate reached its minimum in 1924. This is the lowest figure on record and proves, if proof were wanted, that the use of antitoxin has saved untold lives. But the continuance of a high attack-rate in the metropolis calls for anxious thought. It seems to the Board that the time has come for the adoption of measures calculated to restrict more effectively than hitherto the depredations of the disease, and in this connexion the recent figures for New York City, which are quoted in the report, should be studied by those taking an active part in the maintenance of public health. All will agree with the opinion of the Board that a case has been made out for strict consideration.

SUGAR AND ATHLETICS.

THE most entertaining function of modern scientific discovery in the departments of applied physiology, domestic science, and the like is to find out not what we ought to do, but why we do what we do. We know now—more or less—why we should eat cabbage; we know why a man cannot run a mile as fast as he can run 100 yards and cannot hope to do so; we have a rationale for loafing in the sun. We do not know why we use soap to clean ourselves with, nor how to wash woollen socks without shrinking them; science has addressed itself to these problems, but has failed to find a solution satisfying to the housewife. No serious attention appears to have been given to the problems of why no one can eat rabbit daily, and why a white silk shirt must not be dried in the open like a cotton one for fear it will go yellow. Still, much has been and more will be discovered, and we may expect in time a due recognition by the public who are curious about dietetics of the renaissance of healthiness which emerged from the discovery by the Dutch of cabbages which would stand the winter. There has been going on the annual lamentation at the lack of interest shown by the general public in the proceedings of the British Association for the Advancement of Science. The truth no doubt is in the first place that the public takes a great deal more interest in the Association than the Association thinks, while in the second place real scientific discoveries leave the public moderately unmoved, because they do not concern their familiar activities. It is very good to know about the shape and balance of the earth, or why the amoeba is of a more useful size than the rhinoceros, and it is wonderful that mere men should be able to find out such things,

but these discoveries do not make much obvious difference to life, and most people would prefer a solution of the sock problem. A naïve contribution to the explanation of our habits is recorded¹ by Dr. S. A. Levine and his colleagues at Harvard. They found last year that some of the runners in a Marathon (or marathon—they print the word indifferently, and it is a nice point) who were particularly exhausted showed an abnormally low blood-sugar and symptoms comparable to those of an overdose of insulin. On further analysis it appeared that exercise such as running first somewhat increases the blood-sugar, but the percentage afterwards drops back to normal, at which it remains until, in some individuals, a further fall appears about the time when they get profoundly tired. On a repetition of the race this year these observers confirmed their findings, and got some of the runners to demonstrate that eating candies was very reviving when exhaustion began to appear. It is interesting to know that physical exhaustion is associated with a low percentage of sugar in the blood, and we are led to wonder whether the same is true of the tired, sleepy state which supervenes when a maximum discharge of adrenalin enables the subject to have a really violent emotion. But the most curious thing is that neither the authors nor the subjects at Harvard seem to have been aware that the consumption of sugar in one form or another is very widely known as preventive and curative of fatigue. Those who believe that white lump sugar really is sugar and not some artifice of a deceitful manufacturer will take it in that convenient form; others pin their faith on a bull's-eye about the sixteenth hole; a long-distance cyclist will start out with a long stick of barley-sugar in his mouth, and gradually incorporate it; sugar cakes are a *sine qua non* at an athletic tea-party. We almost suspect that the Harvard Marathonians have been taking advice about their diet from physiologists—a very dangerous thing to do—instead of from their mothers. However well science may explain diet it is apt to choose it badly, because it neglects the accumulated sum of human prejudices in the field which interests mankind more than anything else.

THE NEW CONCEPTION OF LEPROSY.

THE conception of leprosy as a progressive and inevitably fatal disease is one well established in popular and to a great extent also in medical opinion; but, as is pointed out in a recent article in the *Medical Journal of Australia* (July 11th, 1925), this conception is not necessarily founded on fact. Some 29 years ago Dr. G. H. Taylor, who is at present medical officer to the New South Wales Government railways, in a systematic investigation of the patients in the general wards of the Coast Hospital, New South Wales, pointed out that thickening and tenderness of the ulnar and peroneal nerves and slight anaesthesia of the parts supplied were not uncommon in individuals, in some of whom healed leprosy lesions were found post mortem. Unfortunately, this work appears to have received little recognition in official quarters, while Dr. Taylor himself at that time did not recognise the grave danger to the community of such cases. The recent writings of E. Muir (THE LANCET, Jan. 24th, 1925, p. 169) certainly confirm much of Taylor's work, for he has demonstrated leprosy bacilli in many persons who do not manifest leprosy lesions, and in others who appear to recover spontaneously. It therefore becomes apparent that Dr. Taylor's original conception of the disease is one of considerable historical value.

¹ S. A. Levine, Burgess Gordon, and C. L. Derrick: Some Changes in the Chemical Constituents of the Blood following a Marathon Race. *Jour. Amer. Med. Assoc.*, 1924, lxxxii., 1778.

Annotations.

"Ne quid nimis."

THE NEW TUBERCULOSIS ORDERS.

STATISTICS compiled by Dr. Stanley Griffiths, of Cambridge, and other workers, both medical and veterinary, have demonstrated beyond dispute the dangers to child-life in this country from tuberculous milk, and for a long time it has been a crying disgrace that such milk should be sold without restriction. The situation will be somewhat improved from the first day of the present month onwards, for on that date an Order of the Ministry of Agriculture became law, by which the cow with the tuberculous udder (and its equally dangerous "visibly infected companion") is marked down for immediate destruction. For a long time the veterinary profession has, through the agency of the National Veterinary Association and its branches, been forwarding resolutions to the Ministry of Agriculture, the Ministry of Health, and other authoritative bodies asking that power might be given for the destruction of this very obvious source of danger, not only to its own kind, but also to man. The Animal Diseases Tuberculosis Order, 1925, illustrates well the value of co-operation between the human and the veterinary branches of medicine; the former to control the food of man and the latter to inspect and deal with its source of origin. Of the million tuberculous cows or thereabouts in Great Britain not all are used for dairy purposes, and those which are free from tubercle of the udder may not be an immediate source of danger to the milk consumer; yet at any moment the tuberculous dairy cow may become infected in its udder and pass on living tubercle bacilli in its milk. Under the terms of this Order every person having in his possession or under his charge (1) any cow which is, or appears to be, suffering from tuberculosis of the udder, indurated udder, or other chronic disease of the udder; or (2) any bovine animal which is, or appears to be, suffering from tuberculous emaciation; or (3) any bovine animal which is suffering from a chronic cough and showing definite clinical signs of tuberculosis, shall without avoidable delay give information of the fact to a constable of the police force for the area wherein the animal is, or to an inspector of the local authority, and the constable or inspector shall forthwith transmit the information to the local authority. The veterinary inspector is then empowered to order the destruction of the animal, allowing the owner a fair and mutually agreed sum as compensation. The premises are then dealt with as infected places, and the remainder of the herd also come under inspection. The main point, however, is that the cow with the tuberculous udder, and the cow which is obviously the subject of a general infection, is destroyed, instead of being, as was the case prior to the enforcement of this Act, allowed to be sold, either privately or in the open market, to disseminate her myriads of tubercle bacilli broadcast amongst her neighbours. The September issue of the *Veterinary Journal*, which is entirely devoted to public health work, contains an article by Prof. Goffton, chief veterinary officer to the City of Edinburgh, on the position of the veterinary profession in Scotland in regard to the inspection of milk and meat. Scotland has fully recognised the fact that it is the veterinary surgeon with his professional training in the diseases of animals who is the proper person to give an opinion as to when the cow and its products are suitable or otherwise for the food of man. The Public Health of Scotland Act, 1897, opened up the way for the utilisation of the veterinary surgeon in such work. The Milk and Dairies (Scotland) Act of 1914 imposed on him wider and more important duties in supervising the milk-supply, and a reinforcement of this Act, which also came into force on Sept. 1st last, gives the veterinary officer in Scotland power to

order the destruction, not only of the cow with the tuberculous udder, but of any cow which is emaciated, has a chronic cough, or other symptom of severe tuberculosis.

SANITATION PAYS.

IN the annual report of the medical officer of health of the Port of Liverpool, a note on which we publish to-day, it is observed that the rat inspector is keeping down rat harbourage about the docks, that this involves some trouble and expense, but that some of the officials "even admit that it pays." In the July number of the *Military Surgeon* is a paper by Colonel H. C. Fisher, Medical Corps, U.S. Army, about the sanitary effect on the world of the methodical medical regulation of ships passing through the Panama Canal. He notes the educational effect of the risk of quarantine on neighbouring ports and on shipmasters. The former clean up their ports, the latter ask for rat fumigation, as they have now learned the comfort of being free of rats and other vermin. He adds, "We are receiving . . . words of commendation from shipping interests for the work done . . . shipping is realising that sanitation pays." Sir Malcolm Watson¹ calculated that certain estates in Malaya, employing 29,068 coolies, saved, through malaria prevention, £114,000 in one year, almost £4 per coolie, or 2d. per pound, or £3 10s. per acre on the cost of their rubber. It was estimated in the war that every man dead or invalided home from Palestine cost the nation £1000 for treatment and replacement. We have ourselves remarked that Lord Allenby's break through in 1918 was only made possible by reason of the malaria prevention of the preceding six months, and that to prevent the expected 60,000 fever cases due that autumn among the 70,000 men of that army did, in fact, cost only £40,000 (12s. per man), while treatment of the 60,000 would have cost £1 apiece for quinine alone. All who practise medicine have no doubt that sanitation pays, but there is still want of more economic and statistical teaching to drive this fact home into the minds of the public and of administrators at home. It is more fully grasped in the Empire overseas. Happily, the recent Public Health Act gave local authorities in this country greatly increased power to issue propaganda on health questions.

COLON LAVAGE.

ALTHOUGH injection of water into the bowel is an old and well-established medical practice the present technique of intestinal lavage is comparatively recent. The method known in England as the Plombières treatment was introduced by Dr. Maurice de Langenhagen about 27 years ago for the relief of muco-membranous colitis, and sprang into immediate popularity; since then, however, it has fallen into the disrepute which inevitably awaits a remedy too suddenly fashionable. Much criticism has almost led to its disuse in France; but in England the treatment retains many advocates, and is practised at Bath, Harrogate, Buxton, Llandrindod Wells, and other spas. At Harrogate, for instance, over 127,000 treatments have been given in the past ten years. Some interest will therefore be felt in the considered opinions, or "second thoughts," which Dr. de Langenhagen contributes to a symposium on Colon Lavage in the August issue of the *Archives of Medical Hydrology*. He attributes the failure of the treatment in the hands of his critics to a misunderstanding of his aims and technique. Lavage in colitis is to be regarded as essentially a *sedative* measure. The fluid is intended to act, not as an evacuant, but as an internal bath, which clears away mucus, reduces congestion at the orifices of glands, washes the mucous membrane, and reduces the excitability of nerve-endings. Any method which produces spasm or pain is inappro-

¹ Sir M. Watson: The Prevention of Malaria in the Federated Malay States, second edition, pp. 155-6. Murray. 1921.

prate. The bowel is to be "persuaded" rather than stimulated, and to this end the injections must be small and must be made very slowly and at low pressure (12-16 inches). He recommends the use of weak (hypotonic) natural mineral waters, such as those of Plombières or Bath, or of plain boiled water with or without small quantities of common salt (7 per 1000) or bicarbonate of soda in solution. Medicated injections or strong mineral waters should not be employed, as they are likely to irritate the bowel. Two consecutive injections are given at a temperature of 110°-115° F., the first being rejected by the patient and the second retained for a few minutes. A sedative thermal bath or a warm application to the abdomen follows, and the treatment is not given more frequently than once every two or three days. Dr. de Langenhagen claims a measure of success for this treatment in at least 70 per cent. of cases of colitis, and whilst admitting that a certain number of people, perhaps 6 per cent., are intolerant of rectal injections—and in such cases they must be abandoned—he disagrees with those who say that lavage leads to constipation and atony, softens the intestinal wall, and increases the flow of mucus. Given with discretion, the treatment is neither dangerous nor hurtful. Another contributor to the symposium is Sir William Willcox, who states that he has found lavage of very great value in chronic colitis, and as a supplementary treatment in systemic diseases, such as arthritis and diabetes, in which colon toxæmia is an important causal factor. It may usefully be employed in private practice, and can be given by any intelligent nurse. Further contributors, describing the methods in use at Buxton, Harrogate, Bath, Chatel-Guyon, and other places, reveal a lack of unanimity which lends force to the plea that practitioners should carefully consider what may be the presumptive signs of intestinal toxæmia which justify colon lavage; how far liquefaction of the bowel contents affects toxin absorption; which cases require sedative and which require tonic lavage; and, lastly, what is the danger in any given case of adding to the morbid impressions of a nervous patient by local treatment.

LATHYRISM.

OF the forms of chronic poisoning with grain and vegetable food ergotism is probably the best known and most widely studied, although its occurrence, except in parts of central Europe, is something of a rarity. In certain districts in India, however, another form of grain poisoning, lathyrism, occurs with comparative frequency, and the disease has also been reported from Algiers, France, and Persia. This disorder, characterised by a spastic spinal paralysis, is usually ascribed to chronic poisoning by various kinds of common pulse, *Lathyrus sativus*, but recent research work by L. A. P. Anderson, A. Howard, and J. L. Simonsen¹ has shown in a striking manner that this is not the case. These workers had been struck with the fact that despite a popular theory associating lathyrism with an alkaloid in the seeds of *khesari*, the vernacular name for pulse, various chemical analyses of the seeds had given differing constitutions, some observers failing completely to find any poisonous bases in these seeds, while feeding experiments on animals had also given conflicting results. On further investigation it was found that the lathyrus crop was always contaminated with leguminous weeds, which were reaped and threshed with the pulse proper and the seeds of the contaminating plants very closely resemble the pulse seeds in appearance. A vetch, known as *atka*, occurring in samples of pulse from regions where lathyrism was prevalent, was particularly investigated, and it was discovered that while botanically pure *khesari* or lathyrus seeds contained no alkaloidal substances and were without any deleterious effects on animals, the reverse was the case when dealing with *atka*. Other

weeds occurring in *khesari* fields proved harmless, so investigations were confined to the *atka* seeds. Chemical analysis showed that these seeds contained a substance called vicianin, closely related to amygdalin, and also a glucoside, vicin, which, on hydrolysis, yielded a sugar and a base divicine which proved to be an oxy-amino derivative of pyrimidine. Feeding experiments on ducks and monkeys were carried out, using pure *khesari* and contaminated specimens containing varying percentages of *atka*. The ducks received raw grain, both fresh and germinating, and the monkeys cooked pulse, various preparations being used to imitate the diet of the Indians. Careful control experiments were made to exclude starvation and vitamin deficiency, and the workers pronounce themselves absolutely satisfied that *atka* is the substance responsible for the production of symptoms in animals closely resembling lathyrism in humans. Divicine prepared by hydrolysis from vicin is toxic to animals in doses of from 0.4 mg. to 0.5 mg. per gramme of body-weight, and this is looked upon as the poisonous substance in *atka* responsible for the disease. It appears to be a comparatively simple matter to eliminate the contaminating weed from the lathyrus crop by a process of sowing *khesari* in lines a foot apart and removing the seedlings of *atka* in the early stages of growth. It should therefore be easy to prevent the occurrence of lathyrism in those districts where this disease has up to now been not infrequently seen.

AN AMERICAN CONVALESCENT HOME.

NEAR the city of White Plains, New York, there was established in 1915 an institution called the Winifred Burke Relief Foundation. Besides serving as a convalescent home for those discharged from hospitals, it was designed by the founder "for the relief of worthy men and women who, notwithstanding their willingness to support themselves, have become wholly or partly unable to do so by reason of sickness or misfortune." An account of the Foundation and its work has been published in THE LANCET,¹ and in the sixth report,² which has now been issued, there may be detected an undiminished ardour not wholly obscured to English ears by an unfamiliar vocabulary. The centre of the work is the home itself. It comprises 11 buildings standing in 60 acres of ground, and containing about 300 beds, which are divided amongst men, women, and the adolescent. The vast majority of the patients come from hospitals and dispensaries, but others are sent by private doctors, employers, and friends. A convalescent home of this kind, according to the report, "is an institution in the country which receives post-ill and preventive ambulant patients on medical diagnosis, and gives a short rest-exercise physical-mental upbuilding with nurse-medical care, sufficient to return them to normal or substandard life activities." This definition indicates one of the features which makes this home especially interesting. It aims at prevention as well as cure, and the directors believe that the pre-tuberculous, early cardiac cases, and many of those suffering from the milder grades of mental disorder and neurasthenia should be treated in such institutions. Twenty-five per cent. of the cases are chronic; but this is not considered good reason why they should be deprived of what benefit they can get. Convalescent homes on these lines are regarded by the Foundation as one of the most urgent medical needs of the United States, and it is suggested that they will solve a large number of problems. What, then, is the treatment at this model institution? "Homelikeness is not sought . . . a measure of frank institutionalism, with its democracy and anti-neurotic momentum, gives superior results." The individual is saved from his friends; "doctoring

¹ THE LANCET, 1923, ii., 491.

² The Winifred Masterson Burke Relief Foundation, White Plains, N.Y., U.S.A.

¹ Indian Jour. Med. Research, 1925, xii., 613.

and doctor-thinking" are discouraged, and the attendants devote themselves to "courage therapy." Carefully prescribed games are interspersed with rest, and as the patients improve they undertake work in the garden or workshops, again according to prescription. They have to do none of the housework, and in this the institution compares favourably with some English convalescent homes, where tired mothers find a duller repetition of their home duties. In a word, it is clear that the success or failure of such a home depends not so much on organisation as on atmosphere. If indeed the heterogeneous patients "return to the surgeon and the social adjuster erect, colourful, courageous, crutch and whim-free persons," then the triumph is a personal triumph for the members of the staff. To read statistics of admission to this institution is to gain some idea of the number of foreigners in New York, and it is impossible not to sympathise with the ambition to make these largely undesirable elements fusible. In a convalescent home there exist golden opportunities to instil American ideals, and these are not missed at White Plains. But apart from this the Foundation is an interesting experiment, and is designed to solve problems which are English as well as American.

SCANDINAVIAN VIEWS ON RENAL TUBERCULOSIS.

IN 1923, at the fourteenth meeting of the Scandinavian Surgical Society, it was decided that in the interval between this meeting and the next, to be held in the summer of 1925, Scandinavian surgeons should collect their cases of renal tuberculosis and should provide a digest thereof for discussion at the fifteenth meeting. A scheme was drawn up, so that the same data should be provided by the different Scandinavian countries, and while Prof. P. Bull undertook to collect the cases from Norway, Prof. Rovsing was responsible for Denmark, Prof. G. Ekehorn for Sweden, and Prof. Runeberg for Finland. In a communication we have received from Prof. Bull we learn that the fifteenth meeting took place between June 25th and 27th of this year in Copenhagen. The papers which were read on this occasion (some of which he has kindly sent us) give a very favourable impression of the value of this system of pooling the experiences of a great number of surgeons who have been given plenty of time to collect and study their material. Prof. Bull's Norwegian material consisted of 580 cases collected by 21 surgeons; Prof. Rovsing's Danish cases numbered 632, provided by 31 different hospitals; Prof. Ekehorn's Swedish cases numbered 1498, reported from 22 different hospitals, and Prof. Runeberg's Finnish cases numbered 213, all of which hailed from Helsingfors. It is interesting to note how uniform is the experience of practically every surgeon in Scandinavia with regard to certain features of tuberculosis of the urinary tract. It would seem, for example, that in every Scandinavian country this is a disease which is confined to the third and fourth decades of life in most cases. In Prof. Bull's material, for instance, 74.7 per cent. of all the cases were observed in this age-period, and much the same observation was made in the other Scandinavian countries. His ratio of males to females was as 59 to 41, while the corresponding ratio for the Swedish cases was as 57.6 to 42.4. Prof. Bull found that 40 per cent. of his male patients suffered from tuberculosis of the reproductive system, but, curiously enough, this complication of the tuberculosis of the urinary tract did not greatly impair the prognosis. With regard to the complications of nephrectomy, he found infection of the operation wound, which occurred in 27 per cent., the most important, and he emphasises the seriousness of any step which, when taken during the operation, is calculated to infect the wound with tubercle bacilli. Recovery could be claimed for 51.6 per cent. of his cases in which nephrectomy was performed. We have in these lines given but the scantiest of summaries of these important papers,

the contents of which might justly be called encyclopædic. It is to be hoped that means will be found to provide a translation of them into English, French, or German, so that the information they contain need not be limited to the countries of their origin.

THE RÔLE OF THE BLOOD PLATELET.

CONCERNING the source, nature, and function of the blood platelet many theories have been put forward. It has been suggested that it is an entirely independent cell, the function of which is at present almost unknown (Achard, Morawitz, Deetjen, Aynaud, and others); that it is the primordial or embryonal stage of the red corpuscle, a view maintained by Hayem and his followers; or that it is a simple corpuscular element or rudimentary cell—one, however, which plays an important part in the coagulation of the blood, the retraction of the clot, and, as some recent researches seem to show, in the processes concerned with immunity. Again, it may be only a fragmentary protoplasmic residuum of other blood elements, or perhaps a pure artefact which has no existence in the circulating blood. In the course of a thesis¹ published at Rio de Janeiro, Dr. Arnaldo Cavalcanti Marques reviews each of these theories and unhesitatingly rejects the last. After considering the physico-chemical properties, physiological functions, and probable source of the platelets, he discusses their relation to various pathological states, including internal parasitic affections, suppuration, protozoal infections, affections of the blood and blood-forming organs, and shock conditions. The following statement on variations in the platelet count due to certain morbid conditions is given as representing conclusions with which most observers would agree, and which are confirmed by Dr. Marques's own work. An excess of platelets is present in the blood (hyperglobulinæmia) in intestinal verminoses, suppurations, recovery from loss of blood (after a certain lapse of time from the loss), convalescence from acute illnesses, and in the course of chronic disease. The reverse condition (hypoglobulinæmia) is found in the acute stage of hæmorrhagic purpura, in pernicious anaemia, and in the active period of enteric fever. Dr. Marques considers, however, that globulinometry, or platelet counting, is at present of little value in diagnosis or prognosis. None of the methods used for the count (Hayem, Aynaud, Fusari, Giudiceandrea) are free from the liability to serious error, though those of Hayem and Aynaud, singly or combined, furnish approximate results accurate enough for clinical use. He is convinced that the blood platelet plays a very important part in therapeutics.

NEW YORK ACADEMY OF MEDICINE.

THE Academy of Medicine, which is about to move into a new building in Fifth Avenue, was founded in 1846. Since that time it has fulfilled its original objects by holding regular meetings, by maintaining a large library, and by interesting itself in public health problems. At first the Academy was homeless and used for its gatherings the premises of other medical institutions, but in 1875 it bought a house of its own, and in 1890 moved into its present quarters. It has now 12 sections which meet for discussions or to hear papers by distinguished visitors, and its increasing membership and activities long ago made it evident that the present buildings were inadequate. The library, which is the only public medical library in New York and contains over 140,000 books, cannot expand as it should, and its reorganisation has had to be deferred until new premises are found. This state of affairs attracted the attention of the Carnegie Corporation and the Rockefeller Foundation. They appreciated the potentialities of the Academy as an educational centre and decided to devote large sums to its

¹ Sobre o globulino e sua importancia em clinica (concerning the blood platelet and its clinical importance). By Dr. Arnaldo Cavalcanti Marques. Rio de Janeiro: Typ. Revista dos Tribunaes. 1924. Pp. 164 and 3 plates.

development. About £300,000 has been given by the Carnegie Corporation for building purposes, and the Rockefeller Foundation has contributed towards the endowment fund of £500,000. These gifts are conditional, however, on an expansion of activities on rather new lines. A full-time director of the Academy's work has been appointed; the library service is to be developed, and a bureau of clinical information under the direction of a committee on public education is to be set up. Public health work at the Academy has hitherto been in charge of a committee which has made important studies in communicable diseases, quarantine, hospitals, dispensaries, day nurseries, convalescent homes, and the problems of chronic disease. That this side of the Academy's work will not be neglected is evident from the appointment as first director of Dr. Linsey R. Williams, who was Deputy Commissioner of Health for the State of New York, and for three years was at the head of the Rockefeller Commission on Tuberculosis in France. Associated with him in the reorganisation and management of the Academy will be Colonel Frederick P. Reynolds, M.D., the head of the Committee on Public Health, and Dr. E. H. Lewininski Corwin who has for some time been connected with the library. From the British point of view one of the most interesting features of the reorganisation is the proposed clinical information bureau, which is to publish a monthly bulletin. In travelling to or from Europe, American and foreign doctors generally pass through New York, and the bureau is to be a clearing house of information on every kind of medical study available in the States, and also on the facilities existing in Europe. New York itself, with its huge foreign population, is a big field for study and research, and it is felt that by coördination and information this field can be made to yield a far larger harvest. The Academy intends to supply efficient machinery.

IODINE AND ENDEMIC GOITRE.

THE successful results obtained in different parts of the world in the treatment of endemic goitre by means of iodine are known, but the aetiology of the disease is not completely cleared up, and it seems to be going too far, as some authors have done, to say that a geographical deficiency of iodine in the air, food, or water is the specific cause of endemic goitre. The more information which can be obtained from different situations as to the distribution of this disease and the relation between this and iodine deficiency, the easier it will become to prove or disprove such a sweeping statement. Prof. D. B. Blacklock has now reported his observations on the occurrence of endemic goitre in Sierra Leone.¹ He endeavoured to put to the test the theory of a geographical distribution in relation to goitre by tracing the Bagwe river up to its sources in the mountains. Goitre occurs endemically over the area drained by this river, and it was expected that since a natural deficiency in iodine in the soil and water would probably be greater at higher levels, a definite increase in the incidence of goitre would be found in these upper regions. The whole expedition occupied three months and had to be done on foot, and so frequently was a village hut the only accommodation at the various stopping places that there was ample opportunity for observing the sanitary conditions of the population at close quarters. The total number of cases examined for goitre amounted to 2465, which included inhabitants of 37 villages. The incidence of goitre amounted to 10 per cent. among the males and 23 per cent. among the females examined. From the geographical point of view the results were interesting. At lower levels along the course of the river goitre was found to be prevalent, while it was absent at the highest villages; but the whole distribution was so irregular that it became necessary to search for some other factor in its causation. It was discovered that in certain villages pollution of the

water by excreta occurred to a much higher degree than in others, and this marked pollution was associated with the highest goitre rates. Prof. Blacklock points out that mere deficiency of iodine in an otherwise unimpeachable water-supply does, no doubt, account for the occurrence of endemic goitre in certain areas, as in many parts of America, but at the same time he emphasises the fact that such iodine deficiency may, in other countries, be artificially produced by contamination. He suggests that the faeces which pollute the water-supply in the district he was investigating may fix or deviate the iodine in some way, or, alternatively, that "faecal substances or substances formed from faeces by bacteria in the water before ingestion are absorbed and alter the metabolism in such a way as to increase the iodine requirement," thus producing a relative deficiency of this element. As Sir George Newman said in his recent survey of public health, the question of causation is at least a two-sided one, deficiency of iodine intake on the one hand and an abnormal condition preventing its proper assimilation on the other.

Although these and similar hypotheses have been suggested by many workers, it must be borne in mind there is little experimental proof to base conclusions upon. It has been shown that inorganic iodine is readily absorbed into the circulation, and is stored in the thyroid, mainly in the form of organic iodine compounds. However attractive these theories may be, they must be regarded with suspicion until definite chemical and experimental evidence is adduced to support them. It is important that a careful study of all suspected waters with a regard to their iodine content be made before any conclusions can be reached on this question. This has already been extensively investigated in America, but it also requires to be done in regions where the pollution factor is more prevalent. Dolbey and Omar have shown² that in certain of the Nile villages where pollution is present to a marked degree goitre is prevalent, although the iodine content of Nile water is higher than that of the metropolitan water-supply of London. It would appear that in Sierra Leone also the prevention of endemic goitre is more closely bound up with sanitation than with the administration of iodine.

The investigation of the distribution of endemic goitre in America is gradually being extended to cover most of the country, and a report³ has been published on the occurrence of this disease in Colorado. Various surveys have been made from time to time in this State in approximately 57 localities, and on the whole the prevalence of goitre appeared to be greater in the western part of the State, where drinking water is obtained from mountain streams and not from wells as in the eastern districts. No information as to the iodine content of the different waters is, however, available, and in the report it is stated that "it is problematical whether the source of the drinking water has any considerable bearing upon the occurrence of endemic goitre in Colorado, except in so far as the water may be deficient in iodine." The combined results of four different surveys in Colorado, in which nearly 4000 boys and over 13,000 girls were examined, showed that 25.6 per cent. of the boys and 30.4 per cent. of the girls had some degree of thyroid enlargement. These results show a much smaller difference between the prevalence rates for boys and girls than in other parts of the country. For the moment the usual methods of iodine prophylaxis and treatment are to be instituted, but a more intensive survey of the State is suggested to discover the nature of the iodine deficiencies in different localities and their relation to the prevalence of goitre. All such information is of the greatest importance if the problem of the aetiology of endemic goitre is to be solved in as satisfactory a manner as the problem of its prevention appears to have been.

² Dolbey and Omar: THE LANCET, 1924, ii., 649.

³ Public Health Reports, Washington, Jan. 2nd, 1925, No. 1, vol. xl.

¹ Proc. Royal Soc. Trop. Med., xviii., No. 8, 395.

A SCHEME OF MIDDLE-CLASS INSURANCE.

A SCHEME of insurance has just been proposed which is likely to reduce the anxieties of illness for the middle-class family. There is no need again to point out that there is a most important class of the community which has in sickness neither the support of riches nor of the State. It is sufficiently obvious. Practically all the contributory hospital schemes restrict their benefits to those of fairly small income, and as the costs of more complicated medical methods grow larger they form an increasingly formidable sword of Damocles which in suspension whitens the hair and in falling may wreck the home. To insure each member of a family singly against the possibility of disease, in such a way as to cover all medical fees and nursing, is practically impossible for the average man with a small income. Moreover, although a person insured for £6 per week—at a premium of perhaps £6 per annum—may be entitled to claim £30 for disablement by an illness requiring operative treatment, the expense of the operation itself may be as much as £100–£200. The Family Medical Services, Ltd., has issued at Manchester a scheme intended to appeal to middle-class householders who have felt this difficulty. The proposers have the support and advice of Sir William Milligan, and the Association itself has no interest financially in the results of the insurance, which is necessarily speculative in an untried field like this. The policies are underwritten at Lloyd's, so that the security is unimpeachable, and, in contrast to those of some mutual associations which pay benefit only if funds permit, the policies of the Family Medical Services will be definite contracts. Two schemes are issued, the first of which covers only general practitioners' fees, and the second covers, in addition, specialists' fees and operation expenses. It is an essential feature of the scheme that the interests of the underwriters and the insured should be identical, so that the first few pounds paid out in fees, and one-fifth of the operation costs, are borne by the latter. All members of a family residing at home who are eligible must be offered for insurance, and the premiums charged vary, of course, with the number in the family and with the scale of fees and operation charges insured against. No insurance is accepted at any age over 50 at entry, and no child is included of less than 2 years old. At other ages below 12 and above 40 the premiums are larger, and there are certain excepted illnesses including those not common to both sexes; but these are merely the reservations. The benefits are undoubted. The rates charged mean that the average man can secure the services of his own general practitioner, subject to certain conditions, at from 3½d. to 9½d. a week per member of his family, and can cover four-fifths of the expenses of possible operations for a further 3d. to 9d. a week. The cost of the minor yet expensive surgery which corrects smaller defects in children, and is not so much vital as advisable, will also be defrayed under this scheme, and this will probably cause the householder to look less gloomily on such interference. The issue of such policies, indeed, seems calculated to lighten a real burden. No medical examination is required, and it is only to be hoped that the terms are not so generous that they will have to be modified.

PRESERVATIVES IN FOODS.

THE opponents of the new Ministry of Health Regulations, prohibiting the use of all preservatives except two specified chemicals under rigidly defined conditions, are still dissatisfied and are not only carrying out an active campaign in some of our daily papers, but are proposing to take up the question in Parliament and endeavour to obtain a modification of these regulations. In particular, persistent efforts are being made to represent the boron group of preservatives as both harmless and necessary—like the domestic cat. The subject is of great practical importance, so we make no apology for returning to

it and considering the grounds upon which it is suggested the regulations should be modified. These seem to be three in number: that there is inadequate evidence that the boron preservatives are prejudicial; that their elimination will send up the price of many foods in which they are now used; and that their suppression will cause a great increase in "food poisoning."

As regards the harmfulness of boric acid and its salts, there is a respectable body of evidence that when they are present in considerable quantity harm may result from their consumption, and the Departmental Committee on the Use of Preservatives, after carefully considering the evidence, came to a definite opinion on the subject. It is really beside the point to assert that the small quantities necessary for preservation have not been shown to be harmful, since experience has shown that these limits are not maintained, and when the salts are widely used they may be consumed almost daily in a number of articles, thus giving a considerable dose of a substance which is comparatively slowly excreted. The real point at issue, however, is that the use of preservatives is a substitute for cleanliness, and that their addition allows food to be collected, prepared, or stored under conditions which are prejudicial to health. The methods used are only practicable because the added preservative prevents the food decomposing, as it otherwise would under these unhygienic conditions. Their immediate suppression would no doubt dislocate trade and so cause a temporary rise in prices, but this point has not been overlooked in the regulations, which do not come into force immediately, not, in fact, until 1927. Scientific investigators are unanimous that cold storage is a preservative greatly superior to added chemicals and that it can with advantage to public health replace them. There is no trustworthy evidence that such a change will cause a general increase in cost, although certain special types of food may be affected.

The suggestion that the suppression of preservatives will cause an increase of food poisoning is hard to understand, for there does not appear to be a single argument to support it. Presumably the idea is that without preservatives more food will be eaten in a tainted condition, since there will be so much more food of this character thrown upon the market. The use of cleanliness and cold storage instead of chemical additions will probably diminish the quantity of food showing early decomposition changes, since the general effect will be a much higher standard of purity. This view shows a singular lack of appreciation of the cause of food poisoning, which has nothing whatever to do with tainted food, but is a definite infection of the food with specific bacilli belonging to the *Salmonella* and other groups. There is no evidence that boric acid or other chemical preservative has a selective action on these bacilli and will prevent this development, except in so far as their general action is antiseptic. On the other hand, the prevailing factor in the causation of these outbreaks is a defective standard of cleanliness and care of the food which has allowed the specific bacilli to gain access to it and contaminate it. A heightened standard of cleanliness is one of our most important preventive measures.

THE Royal Society of Medicine will hold its first social evening of the session at 1, Wimpole-street, London, W. 1, on Tuesday, Oct. 27th.

MALTON: A HOSPITAL FOR 66 PARISHES.—For the last 20 years the little town of Malton, in the North Riding, has possessed an inadequate cottage hospital housed in a converted private residence. A new building is now about to be erected upon an elevated site given by Earl Fitzwilliam, with larger accommodation and better facilities for dealing with the cases that come in from the 66 parishes in the district of which Malton is the centre, many of which at present have to be sent to Leeds. The new Malton, Norton and District Cottage Hospital will have a large operating theatre with the necessary annexes and an X ray room.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXIX.—THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

PART I.—THE DECISION TO OPERATE.

IN dealing with a patient suffering from exophthalmic goitre or other form of hyperthyroidism, the practitioner will always have in mind the general plan of treatment set forth by Prof. G. R. Murray in this series in *THE LANCET* of August 11th, 1923, and by Sir Hector Mackenzie¹ and Sir William Hale-White.² Elimination of septic foci, rest, diet, drugs, X ray and radium treatment, each has its appropriate place, and in the majority of cases does the patient some good. For those patients who respond well to these measures the question of surgical treatment does not occur. Various reasons may, however, be present to cause the question of operation to be raised, and Prof. Murray has indicated them shortly in his concluding paragraph (p. 293).

A discussion of these reasons and of the methods by which the desired result may be achieved with the minimum risk to the patient will form the subject of this article. It is to be understood that the procedures indicated are only to be entertained when therapeutic measures have not been successful; or when, for other reasons, it is deemed inadvisable to delay.

At what Stage to Operate.

At what stage of the disease, then, should operation be performed? The chief consideration will be the fact that the patient is not improving—or is actually losing ground—at the end of a period of treatment, the length of which must vary according to the social position or the family responsibilities of the individual. No actual time limit can be laid down, though it is certain that operation is very rarely called for within the first six months of the disease. There is, however, a limit to the time during which a heart can endure the constant toxicity without failing in some respect, and when the failure begins it is usually progressive; also exophthalmos may become so extreme that its ultimate disappearance is unlikely, or it may lead to corneal ulceration; or, again, the restlessness associated with the disease may appear to be progressing towards mental instability. If conditions such as these are present when a patient first comes under the care of a practitioner, it is a matter for consideration whether there should be any delay in operating except such as is necessary for thorough investigation. Mental instability may even indicate that the time for operation has passed. If the surgeon can coöperate with a physician interested in these cases, some degree of heart failure should not be a bar to surgical intervention, for there is the certainty of great amelioration in the condition of the patient. The occurrence of corneal ulceration, due to extreme proptosis, should determine early surgical intervention, surgeon and ophthalmologist working intimately together.

The social position and family responsibilities of a patient will greatly influence a practitioner. When complications such as those indicated above threaten or are present, surgical treatment becomes imperative whatever the social position of the patient, but if the individual can afford to, and will, rest completely, there is less risk of visceral degeneration than in one who must work for a living or support a family. The time for operating on these patients can be chosen when they become weary of ill-health, or when the practitioner realises that enough time has been given to non-surgical treatment. With the poor patient the case is different. Even here operation should not

be unduly hurried, but women earning their own living and working-class mothers or fathers of families can rarely rest at home, and there are not enough hospital beds available to give all of these patients continuous rest and nursing for a sufficiently long period. It is to be remembered that it is usually a matter of years and not of months. Furthermore, it is a fact that, because of this lack of facilities for rest, these patients lose ground more quickly, drift around from one out-patient department to another, with occasional periods of rest in hospital, and are not only unable to support themselves or their families, but become permanently ill. The economic factor, therefore, determines surgical treatment earlier in the less well-to-do classes of the community. A review of these factors will, in most cases, leave no doubt in a practitioner's mind when, in the patient's interest, the time has come to consider surgical intervention.

Special Operation Risks.

Such patients present some special operative risks not present in the average surgical case. The symptoms of the disease become incompatible with life if they are allowed to increase beyond a certain degree. Operation undoubtedly augments all of these, at least, temporarily. The knowledge that operation is impending, and the preparation for it, stimulate the activity of the gland, apart from the actual handling of it during operation. This cause was recently responsible for the sudden death of a young patient in the throat department of a hospital while she was waiting for her tonsils to be removed. Extreme mental unrest is a dangerous symptom. Glycosuria is not infrequently present and its type must be determined. If it can be, and is, controlled, it is not a contra-indication to operation, but if it cannot be checked operation should only be performed after careful weighing of the factors. No operation should be performed while the slightest catarrhal condition of the respiratory system is present, because the handling of the region of the laryngeal nerves and the trachea stimulates secretion and interferes with its efficient expulsion, and if catarrh has been present before operation much inconvenience and some danger result. A high basal metabolic rate, and a pulse-rate persisting at or above 130 per minute while a patient is in bed would indicate that operation should be postponed. These conditions can often be controlled temporarily, but sufficiently, to render operation safe (*vide infra*). Walton³ has drawn attention to a fact recognised by all concerned—viz., that patients are decidedly more unhappy in warm weather. This is due to the fact that the skin is always hot and moist, and so heat cannot be eliminated rapidly enough for comfort or safety. Therefore no operation should be performed during a hot spell. C. Mayo has pointed out that it is not an emergency operation, and patients should always await the most suitable time. Lastly, loss of cardiac compensation brings its own dangers, and patients in this condition should only be handled surgically in coöperation with a physician who is accustomed to deal with this type of case, and whose judgment can be relied upon to determine what can and what cannot be done.

Preparation for Operation.

In spite of the general agreement that operation is only to be considered after efficient medical treatment has been carried out, it is essential—in the light of constant personal experience—to re-state the imperative necessity of attention to teeth and tonsils before operation. The frequency with which patients come for operation with large septic tonsils or septic teeth still present shows that the importance of buccal hygiene is not yet sufficiently appreciated by practitioners as being one of the chief factors in medical treatment.

A patient should be prepared to spend at least seven or ten days in bed before operation. During the first two days the pulse-rate is recorded while the

¹ Mackenzie, Sir Hector: *System of Medicine*, Allbutt and Rolleston, vol. iv., part 1, 1908, pp. 383, 384.

² Hale-White, Sir William: *Proceedings of the Royal Society of Medicine, Surgical Section*, 1912, v., 81.

³ Walton, A. J.: *THE LANCET*, 1923, i., 53.

patient is kept at complete rest, but without medication. This shows the drop that occurs as the result of rest and freedom from outside worries. Physical examination, measurement of basal metabolic rate, and urinalysis are carried out. Then iodine medication is given (Plummer,⁴ Mellanby,⁵ Fraser⁶), Lugol's solution, M x. , once a day being sufficient; often too much is given. The resulting drop in the pulse-rate and in the basal metabolic rate is definite, and reaches its maximum in about a week, and the excitability of the patient is usually decreased. The vascularity of the gland and the danger of operation are also reduced, so that the operative death-rate has been brought down from about 4 per cent. to nearer 1 per cent. in the hands of surgeons accustomed to operate upon cases of average severity. This does not mean that a severe case of Graves's disease, or an ordinary case which has undergone an exacerbation of the condition, may be given iodine treatment for a week and then operated upon with impunity; but it is a fact that some patients, who have not responded to rest and the drugs commonly used, do improve in a remarkable manner with small doses of iodine, and have been rendered fit for operation. Iodine must not be given unless the patient is in bed. Larger doses do harm, and no good purpose is served by continued administration. During these ten days of preparation the surgeon is gaining the confidence of his patient.

T. P. DUNHILL, C.M.G., M.D. Melb.,
Assistant Director, Surgical Professorial Unit, and
Assistant Surgeon to St. Bartholomew's Hospital.
(To be concluded.)

Special Articles.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 520.)

VIEWS OF TRADE-UNIONS.

(App. XCII. and Q. 21828-22183.)

EVIDENCE was submitted on behalf of the National Association of Trade Union Approved Societies by Mr. F. Kershaw, Mr. E. Corbey, Mr. G. W. Canter, and Mr. G. P. Blizard.

This Association has an aggregate membership of 1,162,130 insured persons. With regard to the working of the Approved Society system it was stated that 12 years' administration of the Act has led to the conclusion that the "fraternal" factor is a diminishing quantity where it does exist, and that it does not exist at all in the case of vast numbers of insured persons. Further—

Under the present system the "unhealthy" society cannot provide additional benefits, while the "healthy" society can be made still more healthy by the treatment benefits provided through its surplus, which in their turn will produce still greater surpluses in future years.

As to medical benefit, the view of the Association is that while the panel doctors have, as a whole, rendered competent and conscientious service, the limitation of the range of service constitutes a grave defect, and that—

The term "medical benefit" should mean everything that medical and surgical science can command for the prevention or cure of sickness, or, in terms of the individual, everything which the medical profession considers necessary in order to restore a sick person to health.

⁴ Plummer, H. S., and Boothby, W. M.: Jour. Iowa State Med. Soc., 1924, xiv., 66.

⁵ Mellanby, E., and Cowell, S. J.: Quart. Jour. Med., 1924, No. 69, p. 1.

⁶ Fraser, Prof. F. R.: Brit. Med. Jour., 1925, i., 1.

* References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

Medical benefit should also be extended to wives and dependants and the cost of the enlarged service met by contributions, as at present, and by grants from the local authorities, and also by economies to be effected through coördination.

If a valuable medical service were provided, the Trade Union Approved Societies were not afraid to go to their members for essential contributions.

(Q. 22048.) Do you think that under the present conditions of unemployment and depression in industry, and having regard to the new contributions and grant charges proposed under the Widows, Orphans and Old Age Pensions Bill, an increase in the charges for the Health Insurance Scheme is justifiable?—We note that the question, before it was amended to incorporate pensions, has been put to many previous witnesses. Our reply at the time our evidence was decided upon would have been: Give us value for money and we are not afraid of the decision of our members.

It was not unreasonable to assume that if the trade-unions had recommended an increase of 8d. in the contributions—the amount of the new charge for pensions insurance—they would have been considered extravagant dreamers. While not recommending the abolition of Approved Societies, mainly because such an attempted step would give rise to insuperable political difficulties, the witnesses recommended that they should be confined to cash services only.

With regard to a whole-time salaried medical service the witnesses said that this was no essential part of their scheme, but they submitted that the history and traditions of the medical profession showed that it stands out as one in which devotion to duty, to science, and to public welfare takes first place, and they could not agree that medical men would change their characters "if they became public servants instead of the servants of the public."

All hospitals, it was contended, should be organised under one public authority with allied treatment centres. The Labour Party would give voluntary hospitals the option of being taken over by the health authorities entirely or of receiving grants from public funds conditional on efficiency. Pressure on hospital beds in the towns should be relieved by the transfer of convalescent cases to country homes.

EVIDENCE OF APPROVED SOCIETIES.

Grand United Order of Oddfellows (App. XCV. and Q. 22405-22597).—This evidence, which was given by Mr. W. McLean, accountant to this Society, was mainly on questions of machinery as affecting Approved Societies, and included a recommendation that dental treatment should be provided as a general statutory benefit to be administered by the Approved Societies, and a suggestion that the Minister's Consultative Council should be reconstituted on a more representative basis.

United Patriots' National Benefit Society and International Society of Medical Hydrology (App. XCVI. and Q. 22598-22730).—The evidence given jointly by these bodies was confined to the question of spa treatment, and was submitted by Mr. J. M. Roberts, Dr. Fortescue Fox, and Mr. John Halton. The Approved Society has been impressed by the large proportion of its own sickness claims due to rheumatism and allied disorders. They also quoted the Ministry of Health's report, as follows:—

Nearly one-sixth of the industrial invalidity of this country is due to diseases classified as "rheumatic." Each year these diseases are costing Approved Societies nearly £2,000,000 in sick benefit, and the nation over 3,000,000 weeks of work from the insured population alone.

The importance of spa treatment was urged upon the Commission, and it was stated that the spas forming the British Spa Federation were prepared to put into operation a scheme for the treatment of insured persons. It was suggested that while such a scheme at the outset would require financial assistance from the Treasury, its cost would be reflected in large economies in sickness benefit. The suggested scheme included the certification for spa treatment by the panel doctors, examination by a small medical board at each spa, and the extension of existing accommoda-

tion by the establishment of hostels or approved lodgings.

The witnesses appeared fairly confident as to the practicability of increasing the spa accommodation and the availability of the supply of waters, so as to afford adequate treatment to those of the insured population suffering from rheumatic diseases. It was thought that three-tenths of such cases were suitable for spa treatment.

Scottish Coöperative Friendly Society (App. LXXVIII. and Q. 20115-20341).—Mr. W. Thomson, secretary of this Society, gave evidence which included proposals that medical benefit should be extended to the dependants of the insured, and that sickness benefit should be raised at least to the level of unemployment benefit.

The advisability of increasing maternity benefit is doubtful unless steps were taken to limit the fee charged by doctors for attendance at confinements. In practice we understand this benefit is almost or wholly absorbed by the doctors.

Dental benefit, it was submitted, should be extended and made statutory; judging from inquiries received, optical benefit was thought to come next in popularity. It was suggested that where, on questions of medical certification, the State medical referee differed from the panel doctor, the difference, instead of being referred to arbitration, should be settled by the Board of Health bringing the parties concerned together, hearing the evidence, and deciding the matter as between the medical experts and the insured person.

(Q. 20269-70.) Would not that need a third medical man if you want an expert interpretation of the medical certificates?—I would have hopes that the two medical men, the State referee and the panel doctor, if brought together, would come to agreement.

One would have to admit he was wrong?—Yes, and one has to admit he is wrong under present circumstances.

Edinburgh Friendly Societies' Council (App. LXXXI. and Q. 20637-20759).—Mr. T. J. Addy gave evidence. This Council, representing 100,000 insured persons in Edinburgh and district, was opposed at present to the extension of the insured class, but thought that the benefits under the Act should be extended so as to include nursing, dental treatment, and the services of specialists and consultants. They were of opinion that the present method of administration by Approved Societies and Insurance Committees should be continued.

Nursing was regarded as the first essential extension, although the witness agreed that the services of specialists and consultants, as the natural complement of medical benefit, should logically come first. The Council, however, felt that these services could wait as part of an insurance scheme, because of the extent to which they were already available free to insured patients at hospitals.

Sons of Temperance (App. LXXXIX. and Q. 21395-21631).—The membership of this Society is 131,000. Evidence was given by Mr. T. W. Huntley. Recommendations with regard to specialist and consultant services included a suggestion that, in the first instance, there should be a freer and fuller use of the known abilities of those panel practitioners with exceptional qualifications. As the Regional Medical Staff of the Ministry were empowered to employ specialists in exceptional cases, it was thought that this provision might serve as the basis on which to build up such a service. Dental benefit, as a statutory benefit, was the subject of a somewhat qualified recommendation.

As regards the millions in the reserves of Approved Societies, it was stated that there was much misconception in many quarters.

As regards surpluses, similar misleading and exaggerated statements have been made. It seems to be overlooked that there are 14,000,000 or so of insured persons, and that even at the 1922 and 1923 valuations the average surplus declared as available for disposal is, roundly, £2 per insured person, and this sum is to be spread over five years.

In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247-8); The Provision of Medical Benefit (Feb. 7th, pp. 301-3; Feb. 14th, pp. 355-6; Feb. 21st, pp. 403-5);

Financial Provisions of the Act (Feb. 28th, pp. 454-7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508-9); The Approved Societies and the Money Benefits (March 14th, pp. 564-5; March 21st, pp. 623-4); Evidence of the Hearts of Oak Society (March 28th, pp. 677-9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731-3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784-6); April 18th, p. 839; Evidence of Mr. Alban Gordon (April 18th, pp. 839-40); Evidence of Joint Committee of Approved Societies, of Stock Exchange and Lloyds' Health Insurance Societies, and of Group of Catholic Approved Societies (April 25th, pp. 889-91); Evidence of the National Insurance Beneficent Society (May 2nd, pp. 943-4); Evidence of the British Medical Association (May 9th, pp. 993-5); Evidence of the British Dental Association and other Dental Organisations (May 16th, pp. 1044-6); Evidence of the Insurance Committees (May 23rd, pp. 1097-8); Evidence of Various Approved Societies (May 30th, pp. 1135-6); Evidence of the British Medical Association (June 6th, pp. 1184-6; June 13th, pp. 1248-50; June 20th, pp. 1315-6); Evidence of other Medical Bodies (June 20th, p. 1316; June 27th, p. 1348); Individual Evidence (June 27th, p. 1348); Medical Services in the Factory, Ministry of Health Inquiry Room, Evidence of National Sailors' and Firemen's Union and of Loyal Order of Ancient Shepherds (July 4th, p. 36); Evidence of Friendly Societies' Medical Alliance, South Wales and Monmouthshire Alliance of Medical Aid Societies, Friendly Societies' Medical Officers' Union, Association of Approved Societies, Standing Committee of Scottish Insured Women, and Society of Medical Officers of Health (July 11th, pp. 86-8); Evidence of the British Hospitals Association, the Sheffield Joint Hospitals Council, and the Middlesex Hospital (July 25th, pp. 181-2); Evidence of Opticians' Associations (August 1st, pp. 224-6); Evidence of Council of British Ophthalmologists, of Ophthalmic Benefit Committee, of Chemists, and of Drug Store Proprietors (August 15th, pp. 348-50); Evidence of Chartered Society of Massage and Medical Gymnastics, of the Ivory Cross, of Scottish Panel Chemists, Practice among Highland Crofters, and of National Farmers' Union of Scotland (August 22nd, pp. 402-3); Evidence of Nursing and other Women's Organisations (Sept. 5th, pp. 519-20).

WOMEN'S MEDICAL SERVICE FOR INDIA.

THIS service is open to fully qualified medical women of British or Indian nationality who desire to carry on work in India. With the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynaecological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are as follows:—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	"	Rs.500	£480
7 to 9	"	Rs.550	£520
10 to 12	"	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	"	Rs.700	£640
19 to 21	"	Rs.750	£680
22 to 24	"	Rs.800	£720
over 24	"	Rs.850	£760

* At rupee value 1s. 4d.

Furnished quarters are provided, representing an additional Rs.150 per mensem.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent. which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Major-General J. B. Smith, India Office, Whitehall, London.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Criminal Abortion in Germany.

THE problem of the increasing number of cases of criminal abortion was discussed at the annual meeting of the Association of Bavarian Medical Men recently held in Augsburg, where Dr. Hoeber read a paper on the subject. He stated that the birth-rate had decreased from 27.6 per 1000 in 1903 to 20.4 per 1000 in 1924. In 1906 two million living children were born as compared with 1,300,000 in 1924. While the decline of the birth-rate might be partly due to venereal diseases and to contraceptive practices, he attributed a large proportion of it to abortion. Dr. Hirsch, of Berlin, stated that the relation between miscarriages and normal births in the capital was 93 to 100, and Dr. Hansberg, of Dortmund, found that in Germany about 1,000,000 abortions took place annually, with a mortality of 6000. In Bavaria alone, in 530 cases of puerperal fever occurring after a normal birth the mortality was 104, while in 113 cases of puerperal fever occurring after an abortion there were 54 deaths, being a mortality of nearly 50 per cent. This record shows how much more liable to puerperal fever women are after abortion than after normal childbirth. The number of convictions for criminal abortions in Bavaria was, in 1916, 72; in 1918, 138; in 1919, 119; in 1920, 293; in 1921, 538; in 1922, 660; in 1923, 586; in 1924, 690. It is notable that abortions are less frequent in unmarried than in married women, especially where there are already children in the family and the parents feel unable on economic grounds to cope with more. In Germany the excess of births over deaths was 12.1 per 1000 in 1913 against 7.1 per 1000 in 1924. It has been proposed not to punish artificial abortion when performed for economic reasons, so that it might be performed by respectable medical men instead of by unqualified and disreputable persons or midwives. In this way a good many women might be saved from puerperal fever. Dr. Hoeber rejected that proposal and the Association endorsed his view. According to him, it would be a mistake to abolish or to reduce the penalties for criminal abortion without a reduction of penalties in general. It should be the duty of the State, he said, to help poor parents in bringing up their children by providing dispensaries, creches, free meals, and such like. Foundling institutions after the pattern of those existing in some southern countries were not recommended. The children brought up in those institutions without a home and without maternal care, he held, did not prosper. Illegitimate children should, as far as possible, have the same rights as legitimate offspring.

Diseases in the Navy.

Dr. Ruge, a naval surgeon, gave a historical survey in a recent issue of the *Marine-Rundschau* (Naval Review) of some morbid conditions which might be considered endemic in the navy. He first stated that drunkenness was gradually decreasing. Whilst in the "seventies" 0.28 per 1000 of the crew suffered from chronic alcoholism, that number had dropped to 0.08 per 1000 in the period of 1910-14 and had decreased still further during the war and after. Diseases due to acute drunkenness had decreased from 0.52 per 1000 in 1874 to 0.17 per 1000 in 1914. The diseases which he considers to be particularly prevalent in the navy are: colds, injuries, cellulitis, furuncles, and venereal diseases. Colds had been very frequent, the number being, in 1878, 940 per 1000, so that nearly every man had been infected during a year. The number had decreased to 490 in 1912, whilst after the war it had risen again to 570. Diseases connected with colds were tonsillitis, laryngitis, pharyngitis, pneumonia and pleurisy, rheumatism of muscles and joints. Engineers and stokers were especially liable to colds owing to the rapid change between hot and cold air to which they are exposed. In 1896, when wooden ships were still in commission, it was stated that the ratio of cases in such ships, as compared to iron ships, was as 3 is to 4. Among sailors the number of cases is lower than among stokers and engineers, while in the army the case-incidence is three times smaller than in the navy. An improvement had been obtained by compelling the men to change their wet clothes and to keep hardened by going bare foot and by providing cold baths and douches. According to statistical records, injuries are most frequent on Mondays and then decrease throughout the week, a fact in accordance with observations made by the Workmen's Insurance Offices, with regard to artisans being obviously in connexion with the relaxation occurring after the Sunday's pleasures. Formerly injuries were still more frequent and were particularly severe too in the heyday of sailing ships; one-third of the crews suffered from injuries, whilst now only 5 per cent. were affected. As to furunculi, the report states that those on the neck are very rare owing to the absence of collars in the navy, but it is striking that sailors suffer more than stokers, so that possibly the coal-dust may have a disinfectant action. Venereal diseases were a curse to the navy in foreign ports; in the former East Asia Squadron one-third of the men on an average suffered from venereal diseases. In the whole navy for the past year 17.4 per 1000 were syphilitic, as against 11.8 in 1913. After the war the number of syphilitic patients rose to 34.6 per 1000; this rate, however, was less than that of the merchant marine. Although no exact statistical records exist for the merchant marine, the officer of health of the port of Hamburg discovered 7000 cases of venereal diseases among the sailors within one year. Neurasthenia is not uncommon in the navy as a result of the severe duties, the influence of spirits, and of the climate of the tropics; it was almost unknown in 1877, where only 0.45 per 1000 were recorded, against 5.4 in 1923. Of tropical diseases, dysentery and yellow fever already before the war had nearly disappeared, while malaria had decreased from 78.1 per 1000 in 1877 to the insignificant incidence of 0.07 per 1000 in 1923.

Deaths from Electric Currents.

According to a report made by Dr. Alwensleben to the Berlin Medical Society about 300 deaths annually occur in Germany from electric currents. In Berlin alone 600 injuries are recorded of which ten on an average are fatal. Death from electrical currents cannot be confirmed by post-mortem examination, as the danger of electricity is dependent on the intensity of the current and the duration of its action. Experiments on animals showed that a current of 20 volts did not produce any symptoms, but that 120 volts caused fibrillation of the heart, leading to death, although occasionally the cardiac action could be restored. 2400 volts produced an immediate

cessation of respiration, death occurring in one-fifth of a second. Currents of high tension produce severe burns. Two injured persons were shown to the society where currents of 15,000 volts had produced destruction by burning of an arm which was subsequently removed by operation. The direction of the current is, of course, essential for the prognosis. People with a so-called thymic constitution run greater dangers than others. Artificial respiration may sometimes save life, but the application of faradic currents to the vagus nerve is not advisable.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Irish Free State and the Medical Register.

As anticipated last week the controversy regarding the Medical Register has entered on a new and more encouraging phase. The meeting of medical practitioners, summoned to protest against the proposed action of the Government, contented itself with a less intransigent attitude. The principal resolution was one welcoming President Cosgrave's invitation to a fresh conference, and expressing the hope that the conference might lead to a solution of the problem. On the following day the Consultative Subcommittee met Mr. Cosgrave, together with Mr. McGilligan, Minister of Commerce, in a long conference. In a carefully worded communiqué subsequently issued it is stated that:—

"At the conclusion of the proceedings it was understood that very considerable agreement on a line of policy had been arrived at consistent with the Government's decision to set up a separate Register and Council. It was generally felt that arrangements could be made to maintain existing rights and advantages of Irish practitioners qualifying in the Free State wishing to practise in England and elsewhere. It was also understood that the teaching schools would be in a position to assure their students that no hiatus would arise between the cessation of registration as at present and the adoption of a new scheme."

It is understood that the Free State Government is in hope of obtaining the consent of the British Government to a full measure of reciprocity between the Registers of the two countries. If they are successful in this then the main objections to the Government policy will fall to the ground. It is satisfactory at any rate that the Government and the representatives of the profession are now working in harmony.

Sept. 14th.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs.: A. R. Fisher to the *Columbine*, for R.N. Hospl., Queensferry; T. A. Smyth to the *Vivid*, for R.N. Barracks, Devonport; W. G. Edwards to the *Barham*, and as Squadron Medical Officer; and R. F. MacMahon to the *Malaya*.

Surg. Lt.-Comdrs.: F. E. Fitzmaurice to the *Vindictive*, and W. G. Thwaytes to the *Excellent*, both as specialists in Ophthalmology; F. G. Hunt to the *Champion*; and J. S. Elliot to the *Mackay*.

Surg. Lts.: W. G. F. Murray to the *Scarab*, and J. G. Maguire to the *Barham*.

ROYAL NAVAL VOLUNTEER RESERVE.

L. B. Hartley to be Surg.-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Gen. Sir C. H. Burtchaell, ret. pay, late R.A.M.C., is appointed Col. Comdt., vice Maj.-Gen. Sir H. R. Whitehead, ret. pay, late R.A.M.C.

Maj.-Gen. Sir W. G. Macpherson, ret. pay, late R.A.M.C., is appointed Col. Comdt., vice Maj.-Gen. Sir D. Bruce, ret. pay, late R.A.M.C.

SUPPLEMENTARY RESERVE OF OFFICERS.

Capt. N. H. Smith, late Temp. Capt., R.A.M.C., to be Capt.

ROYAL AIR FORCE.

Flying Officer T. V. O'Brien is granted a permanent commission in the rank stated.

The undermentioned are granted short service commissions as Flying Officers for three years on the Active List: J. McM. Wilder and H. G. Maguire.

Flying Officer H. W. D. Mackenzie is transferred to the Reserve, Class D.1.

INDIA AND THE INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Col. F. O. N. Mell.

Temp. Lt. Shiva Shankar Gupta to be Temp. Capt.

Behari Lal Chopra to be Temp. Lt.

The following have been granted leave: Maj.-Gen. S. F. St. D. Green, Deputy-Director of Medical Services, Western Command. Lt.-Col. A. Leventon, Superintendent, Campbell Medical School, Calcutta. Lt.-Col. A. W. Overbeck-Wright.

The following officers have been posted to Burma: Lt.-Col. E. T. Harris and Maj. S. T. Crump and H. A. H. Robson.

Maj. (actg. Lt.-Col.) (now Lt.-Col.) H. M. H. Melhuish relinquishes the actg. rank of Lt.-Col. on ceasing to comd. a Field Ambulance.

Maj. (actg. Lt.-Col.) (now Lt.-Col.) R. B. B. Foster relinquishes the actg. rank of Lt.-Col.

HOMES AND EMPLOYMENT FOR CONSUMPTIVES.—On Sept. 9th Dr. F. G. Bushnell addressed the Plymouth and District Trade and Labour Council on the need for the proper care of the tuberculous in Plymouth. He asserted that the tuberculosis medical service as it now exists leaves the problems half solved, and is wasteful of both life and money. A system which allows the patient to return to almost certain relapse, and spread of infection to others, is inhuman and unsound. The care and after-care of consumptives should include settlement, housing, and employment, the maintenance of the families of patients who cannot support themselves under ordinary industrial conditions, and their medical supervision. Dr. Bushnell impressed upon his audience of trade-unionists that the principle of employment he advocated is totally opposed to that of exploiting a trade by untrained persons, and that it is quite different from patching up a man so that he can return to his original occupation and infect other men. What must be grasped was that many ex-sanatorium patients can even earn their own living at their own trade, provided that the hours are regulated to their strength, and provided that dividend earnings are reduced or foregone and the large overhead charges taken off their shoulders. But the surroundings must be adapted to their physical and mental condition. To return to the conditions of outside industry usually meant disaster, and after the sanatorium treatment and adaptation to work patients should remain as members of special colonies. Where it was impossible for a person to support himself by his own efforts in such a protected colony, he might still work a reasonable number of hours a day; the balance of loss must be overcome by a subsidy. The only successful tuberculosis settlement was that at Papworth, Cambridgeshire, and amongst the lessons of this great experiment were the following: Patients cannot be trained to a new occupation and left to battle alone with the industrial conditions of commercial life; the wages paid to skilled men must be at the trade-union rate for the number of hours for which they can work without injury; there must be a prospect of promotion in the mind of every settler—e.g., from sanatorium to hut or hostel or cottage, and, in the workshops, from part to full-time employment at union rates and advancement to being head of a department. The products of the settlers must be sold in the open market under the usual conditions, and the medical treatment and supervision must be as efficient as obtains in the best sanatoriums. In conclusion, Dr. Bushnell pleaded for support of a scheme for Plymouth along such lines. Twenty overcrowded badly-housed families, with the (so-called) breadwinner a consumptive, might go into decent healthy wholesome quarters, and at the same time Plymouth would benefit by the reduction of its consumptive population.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1925.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register.

Adams, Josiah Oake, 1866 (E).
Aitken, Charles, 1883 (S).
Alderice, George Frederick, 1901 (I).
Alexander, William Nicholas, 1905 (S).
Arnold, Wilberforce John James, 1894 (I).
Arundel, Robert James, 1895 (I).
Attaoullah, Miss Hawa Khairul Nisa, 1922 (E).

Barry, John, 1867 (I).
Barton, Francis Alexander, 1887 (E).
Beaumont, Charles George, 1877 (S).
Bellot, Claude Herbert Lucien, 1910 (E).
Birch, Charles Ormond, 1886 (E).
Blair, Mrs. Nalini Heloise, 1899 (E).
Bloomenthal, Theodore, 1859 (E).
Boyd, John Alexander, 1907 (I).
Brennan, Charles Henry, M.C., 1915 (I).
Briffaux, Philippe, 1915 (For.).
Browne, John Alexander, 1909 (S).
Brownlee, Arthur Oxland Innes, 1917 (S).
Butler, Charles, 1890 (E).

Cable, Walter George Hughes, 1906 (E).
Caley, Henry Albert, 1890 (E).
Campbell, Archibald Way, 1897 (Col.).
Campbell, Duncan, 1918 (E).
Campbell, Sir William, K.C.M.G., C.B., D.S.O., 1872 (S).
Cardozo, Elizabeth Mary, 1917 (E).
Carew, William King, 1914 (I).
Carter, Charles Noel, 1916 (E).
Cartwright, Robert Peplow, 1907 (S).
Castel, Adolphus Leo, 1887 (E).
Chapple, Aubrey Durant, 1885 (E).
Chittoory, Satyaraju, 1922 (Col.).
Cline, Eric Clarence, 1915 (E).
Coghlan, Harold Edward, 1899 (E).
Collins, John Moore, 1900 (E).
Connolly, William James, 1907 (I).
Considine, Patrick Bernard, 1892 (I).
Cosgrave, Alexander Kirkpatrick, M.C., 1909 (I).
Coutts, Duncan, 1905 (S).
Cowen, Alfred, 1893 (Col.).
Crowther, George Dobson, 1882 (E).
Crozier, George Rowland Henderson, 1903 (E).
Cullinan, Nicholas, 1897 (S).
Currie, George Burnett, 1884 (S).
Cuttle, Ronald, 1923 (Col.).

Dantes, Augustus Paul, 1912 (E).
Davidson, Herbert John, M.C., 1916 (S).
Davidson, William Henry, 1901 (E).
Deamer, George Edwin, 1888 (E).
de Boer, Henry Speldewinde, M.C., 1914 (E).
Denny, Charles John, 1865 (E).
de Saram, Herbert John, 1900 (E).
de Silva, Arthur Marcellus, 1905 (E).
De Watteville, Armand, 1876 (E).
Dickson, John Rhodes, 1890 (S).
Doolittle, Francis Xavier, 1916 (I).
Doudney, Edwin, 1870 (E).
Duke, Herbert Lyndhurst, O.B.E., 1910 (E).
Duke, Valentine de Saumarez, 1868 (E).

Eagleton, Arthur Joseph, 1913 (E).
Edey, Thomas Hugh, 1915 (E).
Ellacombe, Gilbert Henry Wemyss, 1896 (E).
Elrington, Nicolas, 1893 (E).
Etches, William Robert, 1883 (E).

FitzGerald, Gerald Hartas, 1918 (E).
Folliot, Harold Harry Bailey, 1908 (E).
Ford, Donald McNeill, 1901 (S).

Gaina, Nariman Jamshedji, 1915 (Col.).
Gardner, Robert, 1896 (S).
Garnett, Evelyn Alice, 1920 (E).
Ghaduri, Dwijendra Nath, 1921 (Col.).
Gilmour, Robert Thomas, 1892 (E).
Goode, George Ernest, 1900 (E).
Gordon, Henry Laing, 1889 (S).
Gracias, Cajetan Manuel, 1921 (Col.).
Grundy, Morris, 1905 (E).
Guinness, Ernest Whitmore Newton, 1892 (I).

Hamilton, Robert, 1901 (S).
Hanratty, Francis Vincent, 1911 (I).
Hardcastle, Alfred Herbert, 1893 (E).
Harcourt, Averyl, 1906 (S).
Hargrave, Herbert John, 1885 (E).
Harpur, James, 1900 (I).
Harris, Walter Terence Joseph, 1922 (Col.).
Harvie, James, 1904 (S).
Haynes, John Frederic, 1916 (E).
Hendricks, Hiram Porter, 1918 (Col.).
Hereford, Charles Francis Alexander, 1905 (E).
Hingston, Henry Sandiford, 1910 (E).
Hobson, Henry Overton, 1899 (E).
Hole, Richard Brasse, 1903 (S).
Huffton, Edith, 1915 (E).
Hunt, Edmund Langley, C.M.G., 1894 (I).

Ievers, Charles Langley, 1910 (S).
Infante, Ferdinando, 1923 (For.).
Ito, Koken, 1923 (For.).

Jackson, Oswald Egbert, 1900 (I).
Jamison, Robert, 1906 (I).
Jesudasan, Samuel, 1903 (Col.).
Johnston, James Alfred, 1880 (I).
Johnston, James Percy, 1910 (I).
Jones, Ralph, 1913 (E).
Joynt, Henry Noble Holton, 1888 (I).

Kaka, Dinshah Limji, 1924 (Col.).
Kelly, William Patrick, 1906 (I).
Kesar, Jean Samuel, 1881 (E).
Kidd, Walter Aubrey, 1876 (E).
Kusunbeker, Gajanan Chintaman, 1915 (E).

Large, Stanley Dermott, D.S.O., M.C., 1912 (S).
Leclezio, George Joseph Alexis, 1900 (E).
Lincoln, Joseph Maurice, 1894 (I).
Longhurst, Sidney Herbert, 1899 (E).
Lyon, George, 1891 (S).

McDonald, William MacLachlan, 1896 (E).
MacDonnell, Henry, C.B., 1861 (I).
Mack, Edmund Garvin, 1908 (E).
McKenney, Charles William, 1910 (I).
MacKenzie, Kenneth William, D.S.O., 1905 (E).

McQueen, Robert Martin, 1903 (E).
MacSwiney, Victor Howard Lucien, 1904 (I).
Maitland-Jones, Elizabeth, 1922 (E).
Mann, Alexander, 1909 (E).
Margenout, William Wendt, 1889 (S).
Marjoribanks, Eslyn Marcar, 1912 (S).
Martin, Louis Charles, 1900 (E).
Massey, Thomas Hunter, M.C., 1906 (I).
Mathews, Charles, 1895 (E).
Mehta, Maneckji Sorabji, 1879 (E).
Mehta, Siavax Byramji, 1906 (Col.).
Meiring, Michael Ferreira, 1915 (S).
Michell, John Charles, 1885 (E).
Milne, William Stuart, 1902 (S).
Moody, Ludlow Murcott, 1918 (E).
Morgan, Edward Rice, 1871 (E).
Morrison, Michael Wellwood, 1911 (E).
Muir, David Clark, 1922 (E).
Mullen, Jarlath J., 1874 (I).
Mullick, Sarat Kumar, C.B.E., 1897 (E).

Neary, John Frederick, 1908 (I).
Newell-Roberts, Frederic Norman, 1923 (E).
Nicolas, John Daly, 1904 (S).
Norris, Samuel Knight, 1897 (S).

O'Brien, John Aloysius, 1876 (E).
O'Grady, Donald de Courcy, D.S.O., 1905 (E).
Ohlmus, Walter Theodore, 1916 (E).
Oluwole, Akidiya Ladapo, 1915 (E).
O'Neill, Sydney, 1922 (Col.).
O'Reilly, Bertram Charles Noble, 1909 (E).

Patrick, Joseph Henry, 1885 (E).
Pawan, Joseph Lennox Donation, 1912 (E).
Petrovitch, Milorad, 1924 (S).
Peverley, Walter Augustus, 1897 (E).
Pickthorn, Alfred John, 1886 (E).
Pope, George William, 1917 (I).
Powell, Arthur Worsley, 1895 (S).
Power, John Lawrence, 1905 (S).
Power, Maurice Aloysius, M.C., 1907 (I).
Power, Michael, 1908 (I).
Pratt, William Sutton, 1884 (E).
Pritchard-Airey, William, 1901 (S).
Profeit, Alexander Charles, 1899 (S).

Ramsay, William Millar, 1905 (S).
Ramsey, George Arthur Stuart, 1921 (Col.).
Reid, Alfred, 1900 (E).
Reynolds, Benn Roland, 1919 (E).
Riches, Reginald George, 1909 (E).
Robertson, John Wight, 1915 (S).
Rostant, Pierre Ange, 1916 (S).
Runting, Ernest Arthur, 1912 (E).

Schofield, George Taylor, 1875 (E).
Seed, William Pope, 1893 (E).
Sells, Charles John, 1869 (E).
Shaw, Thomas Clay, 1868 (E).
Shaw, Townsend Wharton, 1889 (I).
Sheil, William Francis, 1918 (I).
Shepherd, Richard le Fleming, 1886 (S).
Shirgoaker, Jagannath Vishnu, 1910 (Col.).
Silverster, William George, 1897 (S).
Simpson, William Henry, 1918 (Col.).
Singh, Bawa Jiwan, C.I.E., 1889 (E).
Singh, Jung Bahadur, 1919 (S).
Sinha, Narendra Prasanna, 1884 (E).
Slack, William Augustus, 1919 (S).
Slaughter, Henry Lawrence, 1921 (E).
Smartt, Edward Nangle, 1886 (I).
Smith, Edward Arthur, 1906 (S).
Smith, Edward John, 1883 (E).
Smith, Ernest Sutton, 1879 (E).
Smith, Harry Emslie, 1900 (S).
Southwick, Michael Harold, 1922 (Col.).
Spence, John Buchan, 1882 (S).
Stevens, Mordaunt Augustus de Brouquens Capel, 1887 (E).
Stevenson, Walter, 1901 (I).
Stewart, John Symington, 1914 (S).
Stott, William Harle, O.B.E., 1897 (S).
Stuart, Forbes Jackson, O.B.E., 1906 (S).
Sully, Albert Max, 1887 (E).
Sutherland, Frederick Charles, 1894 (E).

Tatam, Edwin Charles, 1886 (E).
Taylor, Gerald Maberly, 1906 (E).
Tha, Richard Roland Htoon Oo, 1915 (E).
Thomson, Walter Proudfoot, 1920 (Col.).
Todd, Percy Everard, 1882 (E).
Tomkins, Arthur Wellesley, 1869 (I).
Totsuka, Bunkel, 1922 (For.).
Tucker, William Eldon, 1899 (E).
Twining, Edward Wing, 1913 (E).

Uniacke, John Joseph, 1904 (S).
Urquhart, George Theodore, 1921 (Col.).

Vernon, Robert Culbertson, 1901 (I).

Wallace, Gerald Douglas Hamilton, 1907 (E).

Ward, Francis, 1894 (E).
Waters, John Frank William, 1897 (E).
Waterston, George Fyfe, 1897 (S).
Watkins, Alan Percival, 1900 (E).
Webb, William Leslie, 1912 (E).
West, Percy Coulthurst, 1905 (E).
West, Stephen Harold, M.C., 1904 (E).
Whicello, Harold, 1893 (E).
Williams, Cyril Mathias, 1915 (E).
Williams, Reginald, 1893 (S).
Williams, Ronald Edward, 1921 (E).
Wilson, Arthur William, 1901 (S).
Wilson, Mary Phoebe, 1920 (Col.).
Woodforde, George Arthur Herbert, 1884 (E).
Woodard, Herbert Henry, 1920 (Col.).
Wyndham, Thomas Lancelot, 1899 (E).

Young, John Franklin, 1908 (E).

Public Health Services.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Av. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
County areas—					
Cumberland . . .	—†	—†	7,912	11,725	15.0
Kent . . .	74,113	—†	22,829	15,748	14.6
Notts . . .	49,453	44,020	12,746	10,070	10.7
Urban areas—					
Bilston . . .	—†	—†	1,727	27	13.08
Colchester . . .	—	5,733	1,014	3,019	29.5
Coventry . . .	21,288	19,161	5,860	9,818	21.5

* Excluding dental defects and uncleanness.

† Not given.

Three County Areas.

Cumberland.—Dr. F. H. Morrison warmly praises the loyalty and support of his staff, medical as well as nursing, in carrying out their ever-increasing duties which have called for many hours of overtime. Depression of trade and unemployment, with their consequent lack of funds, produce more ailments among the children, coincident with lessened ability of the parents to obtain private medical treatment. Dr. A. H. Towers has drawn attention to the prevalent but unnecessary method of marching children into the class-rooms with much stamping of their feet—to keep time with the piano—and so raising clouds of dust which is highly injurious to the whole school population. He suggests that as little noise as possible should be the aim. Many methods for allaying dust are now in use in various places—e.g., the periodical spraying of floors with a dustless oil not only allays the dust, but decreases the cost of scrubbing, and prolongs the life of the treated floor. Dr. Morrison questions why there should be a bigger percentage of intermediates (17 per cent.) and of leavers (15 per cent.) requiring treatment than of entrants (14 per cent.). Is it not largely accounted for by the fact that the vision and hearing of entrants is very seldom tested at routine examination? The main causes of pathologically enlarged tonsils and adenoids are summarised as (1) bad teeth; (2) insanitary conditions of any kind; (3) impure water-supplies. All of these admittedly aggravate the condition, but the cause or causes lie deeper, as is evidenced by the many sufferers who have never been subjected to any such disadvantages. Since only one dentist is employed, none but the worst cases of dental caries can be referred to him.

Kent.—Among many interesting tables in Dr. A. Greenwood's report is one showing the percentages of dental caries in the various routine age-groups. The 8-year-old children, as is usually found, have the worst teeth. Mr. C. E. Thomas, one of the dentists, draws attention to the increase of dental caries at all ages. Much propaganda work is carried out by the dentists in lectures to mothers both at the schools and at the welfare centres. Dr. S. A. Tucker, in his inquiry on "the health of groups of school-children with special relation to breast-feeding," shows how, in almost every particular, the breast-fed child carries its early advantage well into school life. A smaller percentage of dental caries is present in breast-fed children than in hand-fed. Throat, nose, and ear trouble is less, and the percentage of breast-fed children having "no history of illness" is twice that of hand-fed children. Dr. F. Wolverson, in his investigation into malnutrition, finds that bread and margarine with tea is the common breakfast in Kent, and bedtime is "any old time." In a laudable endeavour to stimulate the interest of the parents he runs a voluntary "nutrition" clinic in his own time and without expense to the local authority.

Dr. Greenwood remarks on the large amount of malnutrition recorded in secondary schools—373 cases among the girls and 126 among the boys. This is a disquieting feature and deserves the attention which Dr. Greenwood proposes to give to it. Dr. J. Selve reports on the condition of tonsils and adenoids, for which he recommends treatment—only local conditions are mentioned, but the local sepsis may and often does have general ill-effects, and many anæmic and pretuberculous children have reacted extraordinarily well to the radical removal of septic tonsils and adenoids. Dr. W. Lessey finds there is a greater proportion of children showing marked anæmia in the country schools than in the town schools in his area. The macroscopic judging of anæmia is so dependent on the personal factor as to be misleading, and Dr. Lessey's percentages are very high—viz., 21 per cent. (slight and marked) in country schools and 19.7 per cent. in town schools. He associates the anæmia with four conditions: (1) Loss of blood from body parasites, mainly fleas, and from this cause he estimates that in the worst cases of flea bites some children were losing "pints of blood each year." (2) Diet—the iron-containing foodstuffs are largely omitted in the common dietary of these children. (3) Defective teeth. The proportion of dental caries is higher in country children than in town children, largely owing to lack of dental attention. (4) Ventilation and heating. The hygienic home conditions in the country are worse than in the towns.

Nottingham County.—Dr. T. E. Holmes, the school medical officer, contributes an introduction to a report by Dr. C. Tibbits, the senior assistant. The idea of furnishing the names of the 14 clean schools is an excellent one. Dental conditions and treatment are fully described—the quality of the work is evidently better than the quantity, but the reasons for the low percentage of defects treated (34 per cent.) are clearly stated. There is no special school of any kind in the area, except one which deals with mentally defective boys only, and the lack of a mentally defective girls' school is rather serious. For other types of exceptional children it may be said that a fair use appears to be made of special schools and institutions in other areas. There have been some excellent voluntary orthopaedic clinics recently established by the Nottingham Cripples Guild, where all kinds of early treatment and after-care are carried on. A special investigation deals with goitre, as suggested by the Board of Education, but on more extended lines. The incidence is compared according to locality, environment, and geological formations, and it is shown that none of these have any marked influence in this county; in fact, limestone formations are actually associated with the lowest figures. The only definite difference is the higher figure for the western districts, and for this Dr. Tibbits discusses a possible explanation—namely, that the western side of the county is more shut off from the sea winds in which some at least of the iodine travels.

Three Urban Areas.

Bilston.—In his short report Dr. T. Ridley Bailey draws attention to the poor hygienic condition of many of the schools in the area. Structural defects are admittedly difficult of remedy in these financially stringent days, but mere lack of attention on the part of school caretakers is reprehensible. Since the S.M.O. is also M.O.H., and carries out his duties unassisted except by one school nurse, the work must of necessity suffer—the small numbers of special cases (13) and of re-inspections (14) seem ample evidence of this, and is reflected in the lack of interest of the parents, only 28.5 per cent. being present at routine examinations. No school dentist is employed, and as Dr. Bailey states: "With 43 per cent. of children showing four or more teeth decayed and 37 per cent. with conditions less severe, the committee have abundant evidence that the appointment of a dental surgeon is extremely urgent." No case of bronchitis and only one cardiac (functional)

defect is recorded in the return of defects found at medical inspection. Apparently no special provision is made for abnormal children in the area.

Colchester.—The comparative tables given by Dr. W. F. Corfield show at a glance the results of the work during the last few years. The progressive growth of cleanliness and the consequent decrease in "dirt" diseases is clearly shown. The percentage of clean heads has risen from 89.7 per cent. in 1922 to 94.7 per cent. in 1924, while scabies, impetigo, blepharitis, and conjunctivitis have all decreased in the same period. Appreciation of the benefits of the medical work is evidenced among the parents by the percentage who attend the inspections—viz., 77.8 per cent. It was thought advisable to close many of the schools during epidemics, but it is extremely doubtful if this measure is at all effective in urban districts. To provide for those children with very defective eyesight a new "sight-saving class" with up-to-date apparatus was established. In spite of further provision being made for dental treatment, 60 per cent. of the children requiring treatment failed to get it.

Coventry.—Dr. E. H. Snell remarks that the increase of verminous heads from 1400 last year to 2200 this is more apparent than real, and is accounted for by the fuller inspection consequent upon the increase of nursing staff. Tuberculosis is comparatively rare amongst the school population, the percentage of definite cases of all forms being only 0.15 per cent., and more than half of these are cases of glandular affection. Visual defects were found in 7.6 per cent. of the children examined, and comment is made on the not uncommon discovery of children of 11 years with very bad eyesight. It is in such cases that observant teachers could render much assistance by bringing them to the notice of the S.M.O. Only 54 cripples of school age are known to the school medical department, and amongst them no case of cardiac defect is mentioned. This is an incredibly small number, as Dr. Snell himself admits. No case of malnutrition was noted during routine medical inspections, and only three cases of anaemia were seen—either the standards adopted by the examining officers are very low or Coventry is an unusually healthy place. Comment is made on the percentage of poor nutrition being highest in the intermediate group, and it is tentatively suggested that this may be due to war conditions falling heaviest on this group. In part it may be so, but the 7 to 8 year old period is essentially the "stretching" period when the children of that age are relatively taller and thinner. Two excellent open-air schools are held, but the accommodation is much too limited for the number requiring such treatment.

PORT SANITARY AUTHORITIES.

THE annual report of the medical officer of health to the port sanitary authority of *Liverpool* for the year 1924, signed by Dr. E. W. Hope, the former M.O.H., and by Dr. A. A. Mussen, his successor, gives a very full account of the discharge of great responsibilities of these officers in relation to the port. As regards infectious disease, only one case of small-pox (from Lisbon) was landed; from one ship eight cases of typhoid were recorded (from Bombay), one died on board, three were sent to Fazakerley Hospital, four were later reported from their homes; no cases of plague, cholera, or typhus occurred; 58 cases of phthisis came under notice, 29 in sailors and 29 in passengers. Several infectious cases were accommodated in the port sanitary hospital at New Ferry. Grain dermatitis caused by a mite (*Pediculus ventricosus*) in barley from Morocco occurred among dock labourers, and people living in adjacent houses into which the dust of this cargo was blown were also infected. Rats to the number of 62,953 were caught or destroyed; in the city, 1120 were black and 15,171 brown, but in the port the proportions were reversed, 14,809 being black and 326 brown—in all over 15,000 of each. Five ships were fumigated with hydrocyanic acid, averaging 21 rats killed in each, and in 106 ships sulphur dioxide was used, averaging 60 dead in each.

The number killed by the Corporation staff is not a measure of the staff's activity, as its chief function is to keep moving on and taking samples for examination from all round the port in order to get early warning if the rats in any area are becoming plague-infected. Of 6506 rats inspected in 1924 all were free of plague. Rat-catching in ships is the duty of the owners. The number of rats ashore is diminishing by extended use of ratproof sheds. Rats find harbourage in temporary wooden offices, in accumulated sweepings, and in heaps of working gear. One inspector devotes most of his time to this problem; his standard is high, and he has secured the coöperation of the officials of the docks: "some even admit that it pays." An investigation on the destruction of vermin, particularly bedbugs, as carried out by Prof. R. Newstead and others, is reported in an appendix. As a result of the investigation, 3 per cent. hydrocyanic acid gas is recommended for the complete extermination in three hours of bedbugs and their eggs, but tongued and grooved wooden linings of the compartment must first be removed. Venereal diseases are being firmly tackled; there is a seamen's dispensary, with a staff consisting of a whole-time assistant medical officer and two orderlies, one of whom lives on the spot, and is on duty daily till 8.30 P.M. The average patient is very attentive to treatment, but many cease attendance prematurely. Printed cards of advice are issued to ships giving the address of the dispensary, and a small map showing its position. During its ten months of work 428 new cases have attended. The illustrations show the excellence of its equipment. 5194 ship inspections were made by inspectors, 732 by medical officers. Of the nuisances, 91 per cent. were due to lack of cleanliness, often because sailors when they leave ships leave them in a very dirty condition. It is becoming more usual now to take on an extra hand (called a "Peggy") to attend to the cleanliness of the crew spaces, so these dirty conditions may be less constant a feature in future. Many aliens (20,594) arrived in Liverpool during the year; four were rejected as weak-minded or insane, two as suffering from communicable disease, one, a case of trachoma, deported from the United States, as "having a disease likely to cause him to become chargeable to the public." British emigrants numbered 86,693, more than half going to British North America; of the second and third-class passengers, who are all examined by Board of Trade inspectors, 18 were rejected as having infectious disease. Second and third-class passengers for the United States are inspected by a medical officer of the U.S. Public Health Service; if verminous they are disinfested, along with their baggage, at one of the city hospitals. There are seven trained food inspectors, so little delay is caused in the inspection of even the great quantity of food that passes through this port. During the year 89 tons of meat, 161 tons of canned goods, 1217 tons of fruit (partly due to a dock strike), and 3537 tons of cereals were found unfit for human consumption. As much as possible is released to be made up into poultry food, dog biscuit, and the like. In all, 5017 tons of food were condemned, but apparently all this material was utilised in one way or another, though not for food.

Dr. A. B. McMaster, medical officer of health for *Dover*, in his annual report for 1924, states that 3138 brown rats were caught in the town on bird-lime or in traps, 469 in the port, and 32 on board ships. During the year half a million passengers arrived from abroad, of whom 136,607 were aliens. Only two are mentioned as suffering from infectious diseases, one with measles and the other with enteric fever. The import trade of the port is chiefly concerned with fruit and yeast from France, and rabbits, yeast, and poultry from Belgium. Of 35,000 tons of foodstuffs landed 15 tons were condemned. With regard to the health of the town itself, Dr. McMaster reports that the number of families occupying only one or two rooms is increasing, owing to lack of housing. There was in his area in 1924 a milk-borne epidemic of enteric fever, due to the *Bacillus paratyphosus* B;

50 cases were notified, with one death. The source was with difficulty discovered, but the following story was finally elicited. Four retailers got milk from farm B; the report on this milk proved unsatisfactory. At this point Farmer B admitted that the milk came from his brother's farm, C. So now, late, the staff of farm C had to be examined. Farmer C and one of the milkers were found to be carriers, and would take no measure of security till forced, which meant further delay. The epidemic would have been much less extensive had there been water carriage of sewage at the farm, or if the milk had been properly cooled, or if there had been facilities for the washing of hands before milking—in other words, greater cleanliness. Dr. McMaster insists that clean milk can be produced on farms even if the buildings are old, provided that methods of thorough cleanliness are rigidly followed, and that if milk were sent clean from the farms pasteurisation would be unnecessary. The Necessitous Milk Scheme supplied 201 persons in 148 families, 15 taking dried milk.

Dr. A. N. Stevens, medical officer of health for Great Yarmouth, states the death-rate in 1924 as 10·8, infantile mortality-rate 63, birth-rate 18. Most deaths (48 per cent.) occurred after the age of 65. Malignant disease and heart disease each caused 77 deaths, and tuberculosis 62. Infectious disease did not call for any school closure in this year. The chief imports are timber and salt from abroad, stone and grain coastwise; the export is fish. Amongst other foodstuffs, 33 tons of fish were condemned and destroyed. 2463 rats were killed, apparently none in ships or in the port. A rat-catcher has been set to work under the rat officer. Sixty-two vessels were disinfected, and, apart from foul pickle, uncleanness was the chief cause of complaint against ships inspected. The canal boats were all found clean and well kept.

MENTAL HOSPITAL REPORTS.

THE eleventh annual report of the *General Board of Control for Scotland* includes notes of each of the Royal, district, and private institutions in that country, most of which have already been reviewed in these columns. The general survey remarks on the increase in the number of voluntary boarders, and the gratifying fact that parish councils are showing an increasing tendency to pay the cost of voluntary boarders in district asylums, believing that early treatment on this basis may prevent patients from becoming permanent burdens on the rates. Edinburgh Parish Council has arranged for the Royal Edinburgh Asylum to supply 20 beds for voluntary inmates. The undesirable custom of confining adult mental defectives in asylums still continues, but there is evidence of change. The care of the mentally defective is essentially an educational, rather than a clinical or curative, matter, and the two types of mental care do not conveniently go together. It is hoped that the contemplated scheme for the establishment of colonies for adult defective patients will reduce the practice to a minimum. The report suggests the addition of a children's ward attached to the observation wards of infirmaries, for the reception of cases such as encephalitis lethargica. The aim of the Board is to bring their institutions up to the level of general hospitals, and they are able to record that practically every institution in Scotland has a thoroughly equipped dental room and the services of a visiting dentist, while the appointment of specialists in varying branches of medicine is proceeding. Bangour Asylum, which had the advantage of inheriting the most modern treatment apparatus installed when the building was used as a war hospital, has submitted plans for a pavilion where all varieties of hydrotherapy and light treatment will be provided. The problem of typhoid fever in asylums¹ is referred to in the report. The number of carriers in Scottish

asylums is now 16, and elaborate precautions have been taken in disinfection and distribution of under-clothing and bed-linen. The institution where the majority of the carriers are resident is considering the erection of a separate villa for these cases. The statistical tables deal with 18,398 insane patients and 2452 mental defectives.

The *Down District Lunatic Asylum* at Downpatrick publishes an illustrated report. The average number resident during the year was 712; there was a slight decrease in the number of admissions on last year's figure. The majority admitted were melancholic, maniacal and delusional cases being next in number. The recovery-rate was 52·4 per cent. and the death-rate 5·9 per cent., a record figure for this institution. The dentist appointed last year has already treated 264 patients, including 1111 extractions. Two sets of wireless have been installed, and are much appreciated. Nine nurses obtained the M.P.A. certificate during the year, and the new regulations insist on attendants and nurses preparing for these examinations.

Hereford County and City Hospital at Burghill has 470 patients in residence, and, unlike most county hospitals, has a certain amount of vacant accommodation. The death-rate for the year has been 7·5 per cent. and the recovery-rate 29·6 per cent., with a further 10·9 per cent. discharged relieved. The arrears of dental work have been overtaken, and the dentist now finds one visit a month sufficient. A cinema apparatus is to be installed in the near future.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 5TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 32; scarlet fever, 1363; diphtheria, 738; enteric fever, 85; pneumonia, 416; puerperal fever, 44; cerebro-spinal fever, 8; acute poliomyelitis, 12; acute polio-encephalitis, 3; encephalitis lethargica, 43; continued fever, 14; dysentery, 6; ophthalmia neonatorum, 98. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, 22 from measles, 5 from scarlet fever, 28 from whooping-cough, 11 from influenza, and 19 from diphtheria. There were 230 deaths of children under 2 years from diarrhoea and enteritis, as compared with 218, 177, 136, and 108 in the preceding weeks. In London itself the deaths from diarrhoea and enteritis in children under 2 years numbered 38, as compared with 40, 28, 20, and 19 in the preceding weeks; there were 10 deaths from diphtheria, 5 from whooping-cough, and 1 from influenza.

DONATIONS AND BEQUESTS.—Mrs. Mary Ogden, who left £12,430, besides other bequests, gave £100 each to the Cottage Hospital, Colwyn; the Manchester Institution for the Blind; Manchester Institution for the Deaf and Dumb; the Cancer Hospital, Manchester; Manchester Ear Hospital; and the Oldham Institution for the Blind. The residue of her property she left to Oldham Infirmary and the Manchester Royal Infirmary.—Mr. William Wright Ward-Adam, of Frickley Hall, Doncaster, left £2000 to the Royal Infirmary and Dispensary, Doncaster; £1000 to the General Infirmary, Leeds; £500 to the Yorkshire Institution for the Deaf and Dumb, Doncaster.—Mr. James Sutcliffe, of Rochdale, left £1000 to the endowment fund of the Rochdale Infirmary and Dispensary, to be known as the "James Sutcliffe Bequest," and £1000 to the endowment fund of the Manchester Royal Infirmary, to be known as the "James Sutcliffe Bequest."—Mr. Sydney Mason, of Anglesey and Ashton-under-Lyne, left as a contingent reversion £15,000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers.—An anonymous gift of £1500 has been made to the Sheffield hospitals.—Alderman Walter Henry Barrett, of Pendleton, left £1500 to the Royal Hospital, Salford, for the endowment of a bed.—Mr. Frank Atkin, of Sheffield, left £500 to the Sheffield Royal Infirmary, and £250 each to the Sheffield Royal Hospital, the Jessop Hospital for Women, the Sheffield Institution for the Blind, the Sheffield University, and the Sheffield Society for the Prevention of Cruelty to Animals.—Miss Lilian Suzette Gibbs, F.L.S., of Santa Cruz, Tenerife, has, among other bequests, left to the University of London a sum to produce a net annual income of £150 for a studentship in cancer research, either on the physiological or the chemical side, to be called "The Laura de Salicate Studentship" in memory of her mother.

¹ THE LANCET, Sept. 12th, p. 560.

Correspondence.

"Audi alteram partem."

RHEUMATIC INFECTION IN CHILDREN.

To the Editor of THE LANCET.

SIR,—As in part responsible for the emphasis which has been recently laid on the association between the rheumatic infection in children and poverty, may I say that I used the term "poverty" only as denoting the class of children from which hospital patients are drawn as opposed to that dealt with in private practice. That acute rheumatism in its major forms is overwhelmingly a disease of the former group no one could possibly deny. At the B.M.A. meeting at Bath some criticised the use of the word "poverty" on the grounds that the infection is not so particularly common in the children of destitute and out-of-work families as in those of the working artisan class. With the truth of this I altogether agree, though I do not yet understand the reason of it. But it seems a pity to me to obscure the main issue by quibbling over the term "poverty"; surely this is broad enough to carry the sense of the contrast we desire to stress.

For the point is a very important one. Of all the outstanding rheumatic problems there is none of greater importance than that of the environmental influences which predispose to the infection in children, and here we have one great fact to go on—namely, the predilection of the disease for the poorer classes. Let us, therefore, do nothing to obscure this fact. In opening the debate on rheumatism at the Medical Section of the Portsmouth B.M.A. meeting two years ago I particularly emphasised the significance of this association and appealed to workers in public health to find out and tell us the reason of it. At the Bath meeting this year the Public Health Section met the Children's Section in a discussion on the rheumatic problem, and told us of their investigations. It was their presence which made the meeting so different from any previous ones, so significant and encouraging.

I am, Sir, yours faithfully,

REGINALD MILLER.

Harley-street, W., Sept. 12th, 1925.

QUININE IN PNEUMONIA.

To the Editor of THE LANCET.

SIR,—A record of over 200 cases of lobar pneumonia in the Wano Agency, North-West Frontier Province, India, treated with intravenous injections of quinine bihydrochloride, may be of more than local interest. In 1923-24 the death-rate of pneumonia in this agency was very high. It was noticed that there was a high incidence of malaria in the summer, followed by a high death-rate of pneumonia in the winter. As no other form of treatment seemed to lower the death-rate, I resolved to try intravenous injections of quinine. It was found that they had a very beneficial effect. The temperature came down, the restlessness subsided, and the pulse got better and stronger.

As soon as a case was diagnosed as pneumonia a blood film was taken (which by the way in every case was negative for malaria parasites) and intravenous quinine gr. 7 in 10 c.cm. distilled water given. Another injection was given on the third day, and another on the fifth day, after which no more were given. No injection was given during the crisis. Quinine did not shorten the course of the disease or expedite the crisis. In about 50 per cent. of cases the crisis did not take place till the seventh or eighth day. If the pulse was weak quinine was given with 5 minims of adrenalin.

The following points were noticed:—

(1) That patients with enlarged spleens, due to malaria, did not stand a good chance with the quinine treatment.

(2) That when too much quinine was given it had a tendency to make the sputum very viscid, and there was difficulty in expectoration. This was counteracted by tr. jaborand., ℥x, added to mist. stim. expect., ʒi.

(3) That quinine given when the crisis was expected had an unfavourable effect on the heart. The pulse was weak and thready, and the patient showed a tendency to collapse.

(4) That quinine injections given judiciously and in moderate doses definitely had a good pneumococcal effect on the disease even in very severe cases of double pneumonia.

(5) The mortality of chronic malaria cases was more than that of non-malarial cases, who had been free from fever during the summer.

The result of the injections was as follows: In Sarwakai, out of 40 cases of lobar pneumonia, there were three deaths only. In Sararogha (civil), out of 22 cases, there were three deaths. In Jandola there were no deaths amongst the first 30 cases treated, while the average of deaths amongst the remainder was 15 per cent. Those were very bad cases of pneumonia. On the other hand, in the brigade at Sararogha, where the cases of pneumonia were not treated by quinine, the case mortality averaged 25 per cent.

I am, Sir, yours faithfully,

R. KHAREGAB, M.B.,

Captain, I.M.S.; Agency Surgeon, Wano.

THE "COMMON COLD."

To the Editor of THE LANCET.

SIR,—The season of "colds" is at hand; indeed, an epidemic has been already reported. It is a curious fact that the general public has not realised that the common application of the word "cold" is a complete misnomer and, moreover, actually misleading. There is a disarming simplicity about the word, and in the public mind it is associated with "draughts," "cold winds," and so forth, and the idea is inherent that prevention and even cure lie in the piling on of additional clothing.

No doubt there is some connexion with atmospheric conditions, but the public mind has entirely failed to grasp that the symptoms which are grouped together under the name of a "cold" are due to invasion of the system with micro-organisms of varying virulence, and that the results of such invasion are often disastrous. The lengths of the obituary columns in the daily papers during the winter are due mainly to deaths from respiratory complaints, many of which owe their origin to the common cold, and, in addition, it is well known to the medical profession that numerous chronic and disabling diseases can be traced to the same source.

In consequence of this want of knowledge among the community few or no precautions are taken against spreading infection. Sufferers from "only a cold" fulfil their social functions as usual, and attend places of worship and of entertainment, quite regardless of the dangers to which they are subjecting their neighbours. The circumstances of many people suffering from colds are such that it is quite possible for them to remain in bed for the first few days, and if only they would do so, not only would their own disability be shortened, but many susceptible persons would be spared a similar infection. Moreover, it is certain that if such a course could be generally followed, the total number of "lost working days" would be diminished very appreciably.

The time is ripe for a campaign by the health authorities against a complaint whose effects are so far reaching, but the first stage in such a campaign against the "common cold" and its unrealised dangers must be the discarding of its present name and the substitution of another more expressive of its actual nature.

I am, Sir, yours faithfully,

JOHN ALEXANDER DRAKE, M.D. Lond.,
D.P.H.

Harley-street, W., Sept. 12th, 1925.

Obituary.

WILLIAM ODELL, M.D. DURH., F.R.C.S. ENG.

By the recent death of Dr. William Odell, of Torquay, in his seventy-fifth year, the medical profession has lost a fine example of all that was best in the "old school" of family practitioners. William Odell was educated at St. Paul's School, Stony Stratford, and at Hertford Grammar School. He received his medical education at St. Bartholomew's Hospital, qualifying as licentiate of the Society of Apothecaries in 1872. He gained the M.R.C.S. Eng. in the same year and the Fellowship four years later, when resident surgical officer at Hertford County Hospital. In 1901 he became M.D. Durh. After holding hospital appointments for five years, he took up private practice in Hertford in 1878 and later in Toronto, until in 1889 he settled in Torquay. Dr. Odell held the appointments of honorary consulting physician to the Western Hospital for Consumption, honorary consulting surgeon to the Erith House Institute, and honorary physician to the Temple Lodge Home. He was an honorary life member of the St. John Ambulance Association, and did much work in connexion with the Epsom College Foundation, of which he was local secretary. During the war he was physician to the Western Auxiliary Military Hospital in Torquay. Throughout his professional career he took an active interest in medical education and politics, and was at one time president of the Torquay Medical Society. Dr. Odell made several contributions to medical literature, particularly with regard to the treatment of tuberculosis.

THE LATE DR. R. B. ESKRIGGE.—Richard Bertram Eskrigge, L.R.C.P. Edin., M.R.C.S. Eng., of Royston, Barnsley, Yorks, died on August 31st in his sixty-third year. He received his medical education at the Manchester School of Medicine, qualifying as L.R.C.P. Edin. in 1885, and obtaining the membership of the Royal College of Surgeons of England in the same year. For 37 years he practised in Royston, where he was held in the highest esteem.

THE LATE DR. G. LOVE.—Gilbert Love, senior, M.D. Belf., of Great Budworth, Cheshire, died at the age of 60 on Sept. 6th, as the result of a distressing accident when on holiday at Downpatrick in the north of Ireland. While out shooting, he passed through a hedge and a twig released the trigger of his gun, with the result that the charge shattered his leg. He lay bleeding for some time before he was removed to the local infirmary, where the limb was amputated. Dr. Love, who was one of the best-known practitioners in Cheshire, studied at Queen's College, Belfast, where he gained the medal in midwifery and diseases of women. He graduated M.D., Ch.B., B.A.O. in the Royal University of Ireland in 1888, and after serving as medical and surgical assistant in the Royal Hospital, Belfast, settled in Northwich, where he had an extensive practice, and was honorary surgeon to the Victoria Infirmary of that town. Dr. Love was a prominent Freemason, being Provincial Officer and Past Master of the Sincerity Lodge, Northwich. He was chairman of the Conservative Association, the Budworth Fête Committee, and the Northwich Infirmary Medical Board.

THE LATE DR. W. J. LEIGHTON.—William James Leighton, M.D. Belf., of Chorley, Lancs, was found dead beneath his two-seater car on the night of Sept. 8th in Lucas-lane, close to Chorley. The car was overturned broadside across the lane, with lights burning. How Dr. Leighton lost his life is entirely unexplained. Dr. Leighton was 42 years of age and had practised in Chorley for nearly 15 years. He had consulting-rooms in St. Ann-street, Manchester, where he was hon. assistant surgeon in the out-patient department of St. John's Hospital for the Ear and Nose. At Chorley he was hon. medical officer of the Rawcliffe Hospital and hon. secretary of the Chorley Medical Society. He received his medical education at Belfast and Dublin, and in 1906 graduated M.B., B.Ch., and in 1909 obtained the degree of M.D. at Belfast. Before going to Chorley he was house surgeon to Bedford County Hospital and resident medical officer of the Belfast Corporation Fever Hospital, and resident clinical assistant at the Richmond Hospital, Dublin.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A two weeks' intensive course in medicine, surgery, and the special departments begins on Monday, Sept. 21st, at the Westminster Hospital. On the same day the Brompton Hospital starts a special two weeks' course in diseases of the chest. Beginning in October the Fellowship of Medicine will hold a series of lectures on tuberculosis in the lecture room of the Medical Society, 11, Chandos-street. The first lecture will be given on Oct. 12th, at 5.30 p.m., by Dr. L. S. Burrell, on Tuberculosis from the Physician's Viewpoint. All members of the medical profession will be welcomed. Also during October will be held a special course in diseases of the throat, nose and ear at the Central London Throat, Nose and Ear Hospital (an operative surgery class will be held in addition); a course in tropical medicine consisting of eight clinical demonstrations on Tuesdays and Thursdays; a combined course in diseases of children; a course in urology at St. Peter's Hospital; and a course in dermatology at St. John's Hospital. Copies of any syllabus, together with the Fellowship programme, may be obtained from the Secretary, 1, Wimpole-street, London, W.1.

OPENING OF THE MEDICAL SCHOOLS.—The following functions will be held in connexion with the opening of the undermentioned London medical schools:—

St. Bartholomew's Hospital.—Old students' annual dinner, Thursday, Oct. 1st, in the Great Hall of the hospital. Chairman: Mr. J. Adams.

St. George's Hospital.—The school dinner, Thursday, Oct. 1st, at 7.15 for 7.45 p.m. at the Hyde Park Hotel. Chairman: Dr. Ashton Warner. The Rt. Hon. W. H. Bridgeman will propose the toast of the Medical School.

Guy's Hospital.—Address to the students, Tuesday, Sept. 29th, by Major J. H. Beith ("Ian Hay").

King's College Hospital.—The introductory address, Thursday, Oct. 1st, at 2.30 p.m., by Sir Arthur Keith, at the Medical School, Denmark Hill, S.E. 5. The annual dinner of past and present students will be held at 7 for 7.30 p.m. on the same day at the Connaught Rooms, Great Queen-street, W.C. 2. Chairman: Sir Lenthal Cheatele.

London Hospital Medical College.—Annual old students' dinner, Thursday, Oct. 1st, at 7.30 for 8 p.m., at the Trocadero Restaurant, Piccadilly Circus.

St. Mary's Hospital.—Past and present students' annual dinner, Monday, Oct. 5th, at the Connaught Rooms, Great Queen-street. Chairman: Mr. Leslie Paton.

Middlesex Hospital.—In the Queen's Hall, Thursday, Oct. 1st, at 3 p.m., prize distribution by the Hon. Sir Arthur Lawley; inaugural address by Dr. C. E. Lakin on Tradition in Medicine. Annual dinner, Thursday, Oct. 1st, at the New Criterion Restaurant, Regent-street. Chairman: Sir Arnold Lawson.

St. Thomas's Hospital.—Annual old students' dinner, Friday, Oct. 30th, at the Hotel Victoria, Northumberland-avenue. Chairman: Mr. Samuel Osborn.

University College Hospital.—Annual dinner of past and present students, Oct. 16th, at Hotel Cecil, at 7.30 p.m. Chairman: Dr. Herbert Spencer.

Westminster Hospital.—Inaugural address by Prof. A. E. Gardner, Thursday, Oct. 1st, at 3 p.m., in the board room of the hospital.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—The opening lecture of the winter session will be given at the hospital, Gray's Inn-road, W.C. 1, on Tuesday, Oct. 6th, at 4 p.m., by Dr. William Hill, who will take as his subject The Practice at "The Central" in the Late 'Eighties; a Period of Marked Advance and Foreshadowing Many Modern Improvements in Technique.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The opening meeting of the next session of this society will be held in the society's rooms at the West London Hospital, Hammersmith, on Friday, Oct. 2nd. The chair will be taken at 8.30 p.m., when Dr. H. W. Armstead will read his presidential address entitled Thirty Years of General Practice.

UNIVERSITY OF DURHAM.—In connexion with the opening of the winter session of the University of Durham College of Medicine, Newcastle-upon-Tyne, an introductory address will be given in the Examination Hall of the College on Tuesday, Oct. 6th, at 4.30 p.m., by Sir Humphry D. Rolleston on Physic and Poetry.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual dinner of this society will be held at the Piccadilly Hotel on Friday, Oct. 16th, at 7 for 7.30 p.m. Dr. G. F. Buchan, the new President, will be in the chair, and the council hope that members will be present in large numbers. Ladies are invited, and members are asked to give early notice to the executive secretary, 1, Upper Montague-street, Russell-square, W.C. 1, of their intention to be present, with the names of their guests. A payment of 12s. 6d. for each ticket should be made with applications sent before Oct. 10th; after that date the cost of tickets will be 15s. each.

SOCIETY FOR THE STUDY OF INEBRIETY.—The eleventh Norman Kerr memorial lecture will be delivered by Dr. R. Hercoed, director of the International Bureau against Alcoholism, Lausanne, Switzerland, on Tuesday, Oct. 13th, at 4 p.m., in the hall of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W. 1, when the subject will be Alcoholism as an International Problem. There will be a luncheon at 1.30 p.m. at the Welbeck Palace Hotel, Welbeck-street, Cavendish-square, W. 1, when Sir William Willcox, President of the Society, will preside, and Dr. Hercoed will be present. Tickets 4s. each (exclusive of beverages). Members and associates desiring to be present are asked to send intimation to the hon. secretary, Dr. T. N. Kelyack, 19, Park-crescent, Portland-place, W. 1, with remittance before Oct. 7th.

PEOPLE'S LEAGUE OF HEALTH.—The League, by kind permission of the London County Council, will give the Sims Woodhead series of constructive educational health lectures at the Regent-street Polytechnic. The series will commence on Friday, Oct. 9th, at 6 p.m., and be continued on the following five Fridays at the same hour. Among those who have promised to lecture are: Sir Harry Baldwin, Prof. Leonard Hill, F.R.S., Prof. H. R. Kenwood, Mr. E. B. Turner, Prof. M. S. Pembrey, F.R.S., and Prof. B. J. Collingwood. At the conclusion of the series there will be an optional examination for those who have attended the lectures, and certificates will be issued by the Medical Council of the People's League of Health (with a travelling scholarship prize award, consisting of a week's visit to a foreign country, with facilities for visiting its health centres). Tickets and further information regarding the lectures held may be obtained from 12, Stratford-place, W. 1.

PUERPERAL FEVER AND THE M.A.B.—Arrangements have been made by the Metropolitan Asylums Board whereby in future the cases of puerperal fever referred to the Board will be concentrated as far as practicable in three of their institutions—namely, the Eastern Hospital, Homerton; the North-Western Hospital, Hampstead; and the South-Western Hospital, Stockwell—where special wards will be set aside for these cases and special medical and nursing staffs provided. The Board have also, with the approval of the Minister of Health, appointed an obstetric consultant at these three institutions. A circular (No. 622) has been issued by the Ministry to metropolitan borough councils in which it is recognised that suitable accommodation for cases of puerperal fever is available at other institutions, but expressing the hope that borough councils will take steps to secure, as far as practicable, that full use is made of the accommodation provided by the Metropolitan Asylums Board. The medical officer of health is requested to bring this point to the notice of general practitioners.

DEATH CERTIFICATION AND CORONERS' LAW.—In the course of his fourth presidential address to the Sanitary Inspectors Association, which recently held its thirty-eighth annual conference, Sir William Collins referred to the necessity of further reform in death certification and coroners' law. He recalled the disgraceful conditions which obtained during the last century, and speaking of untrustworthy verdicts, referred to the two classical examples: "Death from stone in the kidney which stone he swallowed when lying on a gravel path in a state of drunkenness," and "Child, three months old, found dead, but no evidence whether born alive." Though administration had effected much, legislation still lagged behind. "I remember," continued Sir William Collins, "in 1895, 1896, and again in 1907, voicing deputations to three successive Lord Chancellors, Lords Herschell, Halsbury, and Loreburn, urging reforms in death certification and coroners' law. From all we received promises of sympathetic and serious consideration, but practically nothing has been done. A Bill has, I understand, been introduced this session by a private medical Member dealing with certain reforms in the matter of death certification and disposal of the dead; but in view of a promise made by the Home Secretary of a Government

Bill on the whole subject the prospects of the private Member's venture are not rosy. It is to be hoped," he added, "that the Home Secretary's assurances may prove more fruitful than those of the three Lord Chancellors."

VIENNA MEDICAL FACULTY.—A comprehensive series of post-graduate courses has been arranged by the Faculty for the academic year 1925-26. A full syllabus and information regarding lodging, &c., in Vienna may be obtained from the offices of the Vienna Medical Faculty, Schloßelgasse 22, Vienna VIII. It is requested that the cost of return postage be enclosed with inquiries.

PATIENTS' PAYMENTS TO HOSPITALS.—A return issued by the London Hospital Sunday Fund states that last year the payments made by patients amounted to £860,000—almost exactly one-third of the total income (£2,590,000) of the metropolitan hospitals. The expenditure was £2,887,000. Just under half a million was received in legacies, and of the total of 13,625 beds, 11,234 were constantly occupied.

CASUALTIES AT THE ROYAL FREE HOSPITAL.—Last year 1751 casualties were received, a number exceeded only by one other hospital. The completion of the first portion of the new home for nurses since the report was prepared will make it possible to open shortly single rooms for private patients of limited means.

LEICESTER PENSIONS HOSPITAL.—This hospital, which during the war served as the Fifth Northern General Hospital, is to be closed in November. There are rather more than 100 men still there, and it is expected that they will be removed to Birmingham.

COST OF TUBERCULOUS PATIENTS.—The annual report of the Hospital for Consumption at Brompton shows that the average stay of its 2389 in-patients was 49 days, and that the cost per head was £24 7s. 10d. The 459 in-patients of the sanatorium at Frimley cost £58 12s. 4d. each. Of the 326 beds at Brompton 280 were constantly occupied.

"A. J. S. RADIO" LUNCHEON.—The initials "A. J. S." are familiar to users of motor-bicycles, and it will not be long before they are equally familiar to users of wireless apparatus. On Sept. 10th "A. J. S. Radio (1914), Ltd." opened their London offices, showrooms, and demonstration rooms, and celebrated the occasion by a lunch. Mr. Edgar E. Lamb presided, and proposed the toast of "Our Guests," which was replied to by Mr. Otto Thomas and Prof. A. M. Low. Whilst manufacturing all sorts of wireless apparatus, including a fine-looking plant stand which is really a loud-speaker set, this company will specialise in compact sets for ordinary listeners-in.

MANCHESTER'S STREET ACCIDENTS: A POSTER CAMPAIGN.—Statistics for the year ending June 30th show that the number of persons killed in this period in Manchester was 59, 6 of these being at cross-roads, 11 at the approach to cross-roads, and 11 at the junction of side streets and main streets. The number of fatal accidents caused by stepping off the pavement in front of approaching vehicles was 24, involving 24 private motor-cars, 24 other mechanically-propelled vehicles, 7 tramcars, 4 taxi-cabs, and a number of other vehicles. In the non-fatal accidents 1855 persons were injured. Of these accidents 376 occurred at cross-roads, 493 at the junction of side streets and main roads, and 524 at other points. 427 of the accidents occurred through persons stepping off the footpath in front of approaching vehicles. In the non-fatal accidents were involved, among other vehicles, 588 private motor-cars, 389 other mechanically-propelled vehicles, 303 tramcars, and 79 taxi-cabs. Eighteen persons were hurt in pillion-riding accidents. On the suggestion of the chief constable it has been decided that the city shall be placarded with large posters warning against the dangers of street traffic, and also that posters warning children shall be placed on public buildings and on all schools in the city. Small forms containing warnings will be distributed to applicants for motor drivers' licences and to motorists' organisations. Similar forms will be supplied to the Director of Education for distribution to all the schools in the city, for the use of teachers so that they may consistently bring these safety rules to the notice of their scholars. There are injunctions to be observed by motorists—what they should do and not do, and a code for pedestrians. From the pedestrian's point of view perhaps the best thing in this poster is this: "Stand, look, and listen before crossing the road." The slogan "stand, look, and listen" ought to be memorised and practised by every pedestrian.

CONVALESCENT HOME FOR MERCHANT SEAMEN.—The Seamen's Hospital Society has for seven years maintained a convalescent establishment, the "Angas Home" at Cudham, near Orpington, Kent, for recovered patients discharged from the society's hospitals in London, but it has recently been found necessary to extend the accommodation. Such extension was made possible by the continued interest of Mrs. L. G. Angas, who gave the original house to the society in 1918, and on Sept. 11th a number of friends of the society gathered at Cudham, when Sir Arthur Clarke, chairman of the committee of management, asked Mrs. Angas to open the new buildings with a presentation gold key. In replying to a vote of thanks proposed by Admirals Sir Henry Jackson and G. R. Mansell, Mrs. Angas said she was glad to provide an extension to the buildings in memory of Captain the Rev. H. W. Angas, who devoted himself to relieving the hardships of seamen. Sir A. Clarke mentioned that, like the other establishments of the society, this building was now opened free of debt, but that £80,000 was wanted annually to keep the work going, and that subscriptions were welcomed. The home is a remodelled and extended country house, now able to take 40 patients, none of whom is chronic, in large grounds with lawns, trees, and gardens, 600 feet above the sea. Of the 40 beds, two, in separate rooms, are for officers; the others are in wards of various sizes. There are smoking rooms and a large billiard room with a piano and stage.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 21st, to SATURDAY, Sept. 26th.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross, W.C. Clinical demonstration every afternoon from 2 o'clock, with special demonstrations three times a week.—WESTMINSTER HOSPITAL, S.W. Special Post-graduate Course in General Medicine and Surgery, and the special departments. 10.30 A.M. to 5.30 P.M. daily. Demonstrations, lectures, &c. (first week).—HOSPITAL FOR CONSUMPTION AND DISEASES OF CHEST, Brompton, S.W. Post-graduate Course in Diseases of the Chest. Operations, lectures, lecture-demonstrations, demonstrations of surgical cases, of cases in wards, and in special departments (first week).—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Lecture-demonstration on Treatment by Electrotherapy on Wednesday, Sept. 23rd, and the three succeeding Wednesdays, at 5.30 P.M., by Dr. C. B. Heald. The Direct Current especially in Relation to Fractures and Injuries.

Appointments.

BINDLOSS, E. F., L.R.C.P. Lond., M.R.C.S., has been appointed Poor-law Medical Officer for Farnborough, Hants.
JONES, H., L.R.C.P. Lond., M.R.C.S., Certifying Surgeon under the Factory and Workshop Acts for the Maesteg District of the County of Glamorgan.
OGILVIE, W. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., Assistant Surgeon to Guy's Hospital.
SAVORY, MARGARET B., M.B., B.S. Lond., House Surgeon to the New Sussex Hospital for Women and Children, Brighton.
Royal Northern Hospital: HUNTER, J. B., F.R.C.S. Eng., Surgeon, and BUTLER, H. O'NEIL, L.D.S. R.C.S., Assistant Dental Surgeon.
The Royal Alexandra Infirmary, Paisley: CALDWELL, J., M.B., Ch.B. Glasg., Senior Resident House Physician; POLLOCK, A. M., M.B., Ch.B. Glasg., Resident House Physician; MACARTHUR, J. C., M.B., Ch.B. Glasg., and GUNN, D., M.B., Ch.B. Edin., Resident House Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Barnstable, North Devon Infirmary.—H.S. £150.
Battersea General Hospital, S.W.—Med. Supt. £300.
Birmingham General Hospital.—Asst. S. £50.
Blackburn County Borough.—Asst. M.O.H. £600.
Buxton, Derbyshire, Devonshire Hospital.—Asst. H.P. £150.
Carmarthenshire Education Committee.—Asst. Sch. M.O. £600.
Chelsea Hospital for Women, Arthur-street, Chelsea, S.W.—S.

Colchester, Essex County Hospital.—H.P. £200.
Denbigh County Council.—Asst. M.O. £600.
Durham County Council.—Asst. Sch. M.O. £600.
East Ham County Borough Education Committee.—Temp. Asst. Sch. M.O. At rate of £600.
Edinburgh, Scottish Board of Health.—Dist. M.O. £1000.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow Royal Infirmary.—Supt. £800.
Hôpital Français, 172, Shaftesbury-avenue, W.C.—Sen. and Jun. Res. M.O.'s. £120 and £100 respectively.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Liverpool, David Lewis Northern Hospital.—Med. and Surg. Tutors and Registrars.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester, Ancoats Hospital.—Asst. Surg. Reg. £40.
Manchester and District Radium Institution.—Asst. Radiologist. £500.
Mental Hospitals Service under the L.C.C.—Eighth Asst. M.O. £432.
Miller General Hospital for South-East London, Greenwich, S.E.—H.P. £125.
Norfolk County Council.—Asst. Tub. O. £600.
Radium Institute, 16, Riding House-street.—Cancer Research Worker. £500.
Royal London Ophthalmic Hospital, City-road, E.C.—Refraction Asst. £100.
St. Bartholomew's Hospital and College.—Res. Asst. Phys.-Accoucheur and Demonstrator of Pract. Midwifery.
St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.—Clin. Assts.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P., three H.S.'s. Each at rate of £50. Clin. Asst. £1 is. per attendance. S. to Ear, Nose, and Throat Department.
South Shields County Borough.—Ven. Diseases M.O. £750.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Throat Hospital, Golden Square, W.—Two H.S.'s at rate of £100. Also Hon. Surg. Reg.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £100.
Whalley, near Blackburn, Calderstones Certified Institution for Mental Defectives.—Asst. M.O. £300.
Whipps Cross Hospital, Leytonstone.—Specialist Consultant in Light Treatment. £300.
Willesden General Hospital, N.W.—H.S. At rate of £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments for Certifying Factory Surgeons at Nairn, Nairnshire, and Guildford, Surrey.

Births, Marriages, and Deaths.

BIRTHS.

HALES.—On Sept. 12th, at Lees Lodge, Sheringham, Norfolk, the wife of Henry Ward Hales, M.D., of a daughter.
HART.—On Sept. 8th, at Platt's-lane, Hampstead, the wife of S. L. Hart, L.D.S., of a daughter.
HASLETT.—On Sept. 6th, at Holmbank, Upper Hallford, Shepperton, the wife of Dr. W. Handfield Haslett, of a son.
HAWLEY.—On Sept. 11th, at Hazelbeech, Coventry, the wife of Thomas Hawley, F.R.C.S., of a son.
MOLLISON.—On Sept. 12th, at Devonshire-place, London, the wife of W. M. Mollison, M.Ch., of a son.

MARRIAGES.

ALLISON—STEEN.—On Sept. 9th, at Fitzroy-avenue Church, Belfast, Richard Sydney Allison, M.D., M.R.C.P., to Elizabeth Newett Barnett (Beth), younger daughter of Mr. and Mrs. J. Barnett Steen, Eglantine-avenue, Belfast.
HOSFORD—RANDALL.—On Sept. 8th, at All Saints Church, Ryde, Reginald Walter Patrick Hosford, M.B., F.R.C.S., to Nora Kathleen, daughter of Mr. and Mrs. F. W. Randall, of Mayfield, Ryde.
MICHELMORE—CHILTON.—On Sept. 7th, at Salcombe Regis, Ralph Godfrey Michelmores, M.B., B.S., of Sidmouth, to Charlotte Macintyre Chilton, youngest daughter of Mr. and Mrs. Charles Chilton.
MORGAN—MITCHELL.—On Sept. 11th, at University Chapel, King's College, Old Aberdeen, George Roderick Morgan, M.C., M.B., Ch.B., second son of George Blacker Morgan, M.D., Sunderland, to Betty Mitchell, M.B., Ch.B., youngest daughter of Peter Mitchell, M.D., Old Aberdeen.
SHORE—HOARE.—On Sept. 12th, at St. Bartholomew the Great, Smithfield, Thomas Henry Gestwyck Shore, M.D., M.R.C.P., to Viola Edith, second daughter of the late Mr. Frederick Hoare, of Craiglands, Crouch End Hill, and Mrs. Hoare, of Stanhope-gardens, Highgate, N.
THOMPSON—WILKIE.—On Sept. 8th, at the Parish Church, Falmouth, Brian G. Thompson, M.D., to Elsie Katharine, daughter of Colonel D. Wilkie, Indian Medical Service (retd.), and Mrs. Wilkie, of Coolmore, Falmouth.
YOUNIE—MITCHELL.—On Sept. 11th, at University Chapel, King's College, Old Aberdeen, John Younie, Indian Civil Service, son of Mr. George Younie, Rothes, to Dorothy Mitchell, M.B., Ch.B., D.T.M., eldest daughter of Peter Mitchell, M.D., Old Aberdeen.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SOME ACHIEVEMENTS OF INDUSTRIAL LEGISLATION AND HYGIENE.

Being an Address delivered to the Congress of Industrial Hygiene, Amsterdam, Sept. 12th, 1925,

BY SIR THOMAS OLIVER, M.D. GLASG.,
PRESIDENT OF THE BRITISH SECTION.

INDUSTRIAL hygiene is a comparatively recent branch of medicine. Although Ramazzini published his treatise on "Occupation Diseases" in 1700, it was the utilisation of steam as a motive power which stimulated the growth of modern industry. The manufacture of pottery, also of bricks for building purposes, is one of the oldest trades. Coal-mining, on the other hand, is one of the most important industries as it is one of the most dangerous. The Romans during their occupation of Great Britain made use of the coal obtained from "drifts" in the city and neighbourhood of Newcastle-upon-Tyne. There was no deep mining for coal in those days. It was in the early part of the thirteenth century that permission was granted by Henry II. to dig for coal in the North of England. During the early part of last century coal-mining in Great Britain was a procedure attended by great hardships, physical and social, upon those who followed the vocation. A hundred years ago the hours of work were long, 12 to 13 per day, boy labour was exploited, and female labour underground was utilised; there was only one shaft leading into the mine, which served both for men and material, and, as a consequence, not only was there no "through ventilation" of coal-mines, but in the event of the single shaft becoming blocked there were no means of escape for the men underground or their comrades above ground reaching them. It was the occurrence of such an accident at a pit a few miles from Newcastle, known as the Hartley Colliery Disaster, 60 years ago or thereabouts, which led to the compulsory provision of two shafts into a mine whereby there is the "through ventilation" which is in use to-day. The winning of coal has always been a hazardous occupation. It was therefore to be expected that the risks and dangers to life in coal-mining through accident and illness, also the long hours of work, would at the earliest opportunity engage the attention of the British Parliament.

Two months ago I was called professionally to see a retired coal-miner, aged 72, who told me that he began work in the mine at the age of 9; that he worked from 4 A.M. till 5 P.M., and for this 13 hours work per day he received 10d. He had to be wakened at 3 A.M., left the house at 3.30 A.M., and had to walk more than a mile to the mine where at the pithead he was obliged to be ready to descend at 4 o'clock in the morning. He often slept while he walked to and from his work, and like the boys younger than himself employed in the mine, he frequently fell asleep at his work, and for which he was ill-treated by the foreman. In the winter months collier boys never saw daylight except on Sunday. It is an interesting fact that as recently as the last decade of the eighteenth century, miners and salters—that is, men who obtained salt from sea-brine—were, practically speaking, serfs in Scotland. Those men could be bought and sold along with the purchase and sale of mines. It was not until 1799 that they received their freedom. The circumstance just mentioned may to some extent explain the deplorable conditions which prevailed in coal-mining in the early years of last century in Great Britain, also the unsatisfactory housing of coal-miners and their families.

Fatal Accidents.

It is impossible to say what the number of fatal accidents was three-quarters of a century ago, for statistics at that period were not kept, but the death-roll was heavy. Before 1814 it was not the custom for inquests to be held on colliers who met their death by an accident in the mine. As showing the death-rate from mine accidents during the latter half of 1800, the following data supplied to me by Prof. H. Louis, of the Mining Department, Armstrong College, are of interest. Taking quinquennial periods, the death-rates from mining accidents per 1000 men employed underground in Great Britain were:—

Year.		Year.	
1851-55	 5.149	1876-80	 2.709
1856-60	 4.628	1881-85	 2.312
1861-65	 3.791	1886-90	 2.042
1866-70	 3.995	1891-95	 1.704
1871-75	 2.736	1896-99	 1.479

If we take two later decennial periods for comparison, we find that the average annual deaths from accidents in British mines due to all causes were: 1873-82, per 1000 men employed 2.5, and from 1911-20 1.3.

With the exception of the United States of America the statistics of other countries also show a decline in the accident fatality-rates.¹ In Germany the rate, which was 3.18 per 1000 men employed in 1879, had fallen to 2.40 in 1914; in the United States the fatal accident-rate had risen from 3.5 per 1000 in 1890 to 3.62 in 1920, while during 1920 the rate for Belgium was 1.13, France 0.77, Great Britain 0.88, and 2.40 for Germany. Coal-mining in the United States is a comparatively modern industry; the men have not been so long trained as those in the older countries. In addition, many foreigners are employed and, as a consequence of difficulties incidental to language, orders given by officials may not be readily understood. The men, too, in order to make high wages work harder than in most countries. If the accident-rate is measured by the number of men killed for every million tons of coal raised, the figures for the United States compare most favourably with those of other countries.

Coal Mining.

Speaking generally for all countries, but especially for my own, the figures show that improvement has taken place in the reduction of fatal accidents in coal-mining, largely consequent upon freer ventilation, daily inspection of the mine for gas before the men descend, greater use of safety-lamps, substitution of the higher explosives for ordinary black gunpowder, also the employment of skilled men to place in situ the cartridges and fire them.

Although one of the most dangerous of occupations, coal-mining in Great Britain remained free from protective legislation until 1842, when owing to the serious condition of affairs revealed by a Royal Commission, women and girls were excluded from working underground. It was not, however, until 13 years afterwards that measures were introduced to protect the health, life, and limbs of the workers. For the saving of life in coal-mines we are indebted to the attention given to the subject by men engaged in chemical and physical research. The employment of the "safety-lamp" recommended by Sir Humphry Davy has prevented many explosions, just as the daily inspection by trained men of the areas at the working face of the mine before commencing to hew coal has been the means of saving many a miner from getting "gassed." One other important circumstance has added considerably to the safety of the miner's vocation. Three-quarters of a century ago the dangers of explosive gases in coal-mines had been recognised, but it was not until a few more decades had passed that Prof. Galloway and Mr. H. Hall showed that as widespread explosions frequently followed the firing of cartridges in mines, some of these explosions were due to the dry coal-dust which was raised into the atmosphere catching fire and travelling with explosive rapidity through the underground passages. Men were thus killed partly by gas, partly by burns, and in other instances, where death was not immediate, by pneumonia. Coal-mining on a large scale in France, Belgium, and Germany is of recent date compared with that of Great Britain. It was not, for example, until 1766 that coal-mining in Westphalia became a prominent industry. Other coal-producing countries have profited by the experience, the mistakes, and failures of British mining methods. As an illustration of how hygienic measures introduced to protect the workers in one direction may inadvertently lead to disaster in another, I cannot do better than reproduce the experience of the German mining authorities in the Ruhr a few years ago. Before the war several of the coal-mines in Central and Western Europe had become infected by ankylostomiasis. I visited the Belgian, German, and Hungarian coal-fields, and I descended into the Lothringen Mine near Bochum. I was much impressed by the excellent organisation, the sanitary measures which had been carefully prepared by Dr. Tenholt, and the adequate hospital provision made by the mine authorities for combating the disease in Westphalia. Although the parasite had gained entrance into the tin-mines of Cornwall, British coal-mines, fortunately, remained free. Ankylostoma ova and larvae require heat and a considerable amount of moisture for their development. A few years previously to my visit to Westphalia there had occurred explosions in the German coal-mines for which high temperatures and the dry coal-dust were partly believed to be responsible. With the view of reducing such risks it was decided to introduce water-spraying into the mines. This, however, only caused fresh trouble, for the mines became infected by the ankylostoma parasite, which it was believed had been brought thither by Polish and Italian workmen, also probably by some of their own miners who during the summer months had worked in the brickfields

¹ Kober: Industrial Hygiene, p. 145.

around Cologne and elsewhere. At any rate, in 1900 water-spraying of mines became general and the result was as follows:—

Year.	Cases of ankylostomiasis.	Year.	Cases of ankylostomiasis.
1896 ..	107	1899 ..	275
1897 ..	113	1901 ..	1030
1898 ..	99	1902 ..	1355

The rapid and great increase in the number of cases of ankylostomiasis after water-spraying can hardly be regarded as a coincidence.

As a class, coal-miners suffer less from pulmonary tuberculosis than most men employed in dusty occupations, but as Prof. E. L. Collis² remarks, "low as their phthisis mortality is, the experience for coal-miners displays certain statistical characteristics which are distinctive of dust phthisis," and these are "(1) an unusually late age of maximum incidence, and (2) an association with high mortalities from other respiratory diseases." Miners who are working at the coal face suffer from phthisis rather more than other miners below ground and workers above ground. Phthisis in coal-miners commences to express itself at and after 35 years of age, as the following figures show:—

Periods.	Age periods—			
	35	45	55	65 and over.
1890-92 ..	1.45	2.07	2.23	2.03
1900-02 ..	1.09	1.52	2.04	1.47
1910-12 ..	1.02	1.31	1.43	1.02

The above data show the improvement which has taken place in the mortality-rate of coal-miners from phthisis.

Manufacture of Lucifer Matches.

There must be many in this audience who like myself, 20 to 30 years ago, were witnesses of the ill-health experienced by men and women who worked in match factories wherein white phosphorus was used. The men who dipped the matches in the phosphorus paste and the women who filled the boxes frequently suffered from necrosis of the jaw-bones or died from septic meningitis or broncho-pneumonia. In other instances where the poisoning was less severe the workers suffered from gastric trouble, anæmia, and albuminuria, or from a tendency of the long bones to become fractured owing to peculiar fragility. So great was the suffering of the persons who became affected that it became imperative that some united action should be taken by various Governments to produce matches which would strike anywhere without the workers incurring risk to their health. As far back as 1879 Switzerland introduced a Bill to prohibit the use of white phosphorus. In 1899 the British Government invited Sir Edward Thorpe, Dr. Cunningham, and myself to visit match works at home and abroad with the view of ascertaining how the workers might be protected against the risks they were exposed to. Like many of our Continental confrères, we were of the opinion that the time had come when a harmless substitute should be found for the dangerous white phosphorus. It was Lorinzer, of Vienna, who in 1845 first drew attention to necrosis of the jaw-bones as an occupational disease, but in every country in which lucifer matches had been made from white phosphorus there had occurred cases of "phossy jaw." Chemists vied with each other to find a safe substitute for the dangerous metalloïd. To French scientists fell the honour of showing how by employing sesquisulphide of phosphorus lucifer matches could be made without risk to the health of the workers. After a congress of the various Governments held in Berne in 1906, the match-producing countries of Western Europe decided to manufacture lucifers by the safe method, and so successful has been the result that the occupation is now free from the risks of three decades ago. Phosphorus necrosis has disappeared. This is one of the triumphs of industrial hygiene of which chemistry and medicine may well be proud and for which we are indebted to France.

Manufacture of Mirrors.

Chemical research has also proved helpful in other trades. It is not so long ago since quicksilver was used in the manufacture of mirrors. Many of the men then employed suffered from mercurial poisoning. Apart from the unhealthy conditions set up in the mouth through vaporisation of quicksilver, the workers became the victims of muscular tremor and occasionally of paralysis. Since making use of nitrate of silver preparations the men have had good health and the industry is now regarded as a healthy one.

Arsenical Pigments.

Just over 20 years ago I was a member of the Dangerous Trades' Committee of the Home Office to whom was given

the task of investigating several trades which were regarded as inimical to health. One of these was the manufacture and use of wall-papers which contained arsenic, also the manufacture, mixing, and use of "emerald green." It had been found that much illness hitherto unrecognised was the result of sleeping in bedrooms with walls covered by paper containing arsenical pigment. Men employed in the grinding and mixing of such colours suffered from ulcers on their hands and fingers and upon the genitalia. In other instances a painful neuritis was established which occasionally ended in paralysis. In the United States, in Holland, and other countries the subject had also received attention. In Massachusetts, for example, a law had been passed in 1900 limiting the amount of arsenic in wall-paper to the extent of 0.1 gr. per square yard, but at the time of the British inquiry alluded to, we found manufacturers had been placing several grains in a square foot of wall-paper. The use of arsenical pigments in wall-paper in Great Britain was subsequently prohibited, their place being taken by aniline and other safe colours. To the fortunate results which have followed in all the trades wherein arsenical compounds are used, stringent regulations, improved ventilation, and the employment of means for the removal of dust have contributed.

As an illustration of the good effected I need only allude to the experience of Sir Thomas Legge who, in 1900, found in one of the London factories wherein "Paris green" was made, that 20 out of the 33 male workers employed therein had to be suspended—that is, 60 per cent.; but as a consequence of more stringent regulations, cleanliness, baths, &c., he found, 13 years afterwards, that the suspension from work were only 0.6 per cent.

Carbon Bisulphide.

Thirty years ago in the manufacture of india-rubber goods in Great Britain there was much serious illness among the men and women employed in the factories. The illness was traced to the use of carbon bisulphide as a solvent for sulphur monochloride in the vulcanisation of rubber. The vapour of bisulphide when inhaled causes intoxication not unlike that which follows the drinking to excess of alcoholic liquors. In the milder forms there are headache, vomiting, and a staggering gait; in the more pronounced form the symptoms, while primarily of the nature of aggravated hysteria, occasionally become those met with in acute mania; in other instances again there are indications of peripheral neuritis followed by paralysis of the limbs. Since new methods of vulcanising rubber by means of the incorporation of flowers of sulphur in a closed chamber under the influence of heat have been introduced, the trade has become healthier and there are no longer the distressing and crippling forms of illness which attacked the workers less than half a century ago.

Lead and Its Compounds.

If there is one metal more than others which since the rise of the modern industries has exacted in all manufacturing countries a high toll of human life it is lead and its compounds. One thing characteristic of industrial lead poisoning is the insidious manner in which it may develop; ill-health may gradually steal over the workers, or on the other hand, symptoms may rapidly show themselves, as, for example, by the sudden onset of acute abdominal pain, or loss of power in one or both hands, between night and morning. As lead and its compounds are used in over 130 industries, this circumstance renders lead one of the most important metals from an industrial point of view, just as, regarded medically, it is one of the most interesting. In Great Britain and in Western Europe lead is present in ore as galena or sulphide, and as this is rather insoluble in weak acid solutions, miners who blast the ore and are exposed to dust do not suffer from plumbism but from a dust disease of the lung called *silicosis*. In the Broken Hill Mines of Australia lead was present a generation ago in the form of *cerussite* or carbonate; this, when inhaled as fine dust, is readily soluble and becomes not only a source of plumbism but of the severer type of the malady known as saturnine encephalopathy. It was a fortunate circumstance for the owners of the Broken Hill Mines that after the *cerussite* layer had been worked out the subjacent ore was found to be galena, for the mining of this was followed by a marked declension in the number of cases of lead poisoning. A strange circumstance, however, has arisen at Broken Hill. Recently there has been a recrudescence of lead poisoning; this was found to be due to the lead ore in places having become changed into *cerussite*.

As regards lead, the dangers of industrial poisoning occurs during the smelting of the ore, the extraction of silver from the pig lead, plumbing and soldering, the manufacture of white and red lead, the mixing and use of paints, the use of lead compounds in the manufacture of pottery and of accumulators for electrical purposes, also in the dyeing of textile fabrics, &c. It is hardly likely, owing to fuller knowledge among the workers of the value of personal

² Journal of Industrial Hygiene, May, 1925, p. 228.

hygiene and cleanliness, improved ventilation wherever dusty processes are carried on, periodical medical examination of the workers and enforced compliance with regulations, that the extremely serious and fatal types of lead poisoning with which some of us were familiar 30 to 40 years ago will ever again be met with to the same extent as formerly. In Newcastle-upon-Tyne, my own district, where it was once so frequent, lead poisoning has ceased to be the menace to the health of the workers it was a few years ago, and what is true of Newcastle is equally true of the country generally. In 1900 the number of cases of industrial plumbism in Great Britain reported to the Home Office was 1058, in 1923 the numbers were 337. The records for 1924 show a slight increase, and particularly is this the case for the manufacture of pottery, but as many of the men and women who have recently died had worked in the pottery trade for from 30 to 47 years it is more than probable that the seeds of their illness were sown before the introduction of the new methods in vogue. The fact remains that there is no comparison, so far as number of cases and severity of the illness are concerned, between industrial lead poisoning to-day and half a century ago.

Conclusion.

Industries rise and wane; methods of manufacture keep supplanting the older, and until new methods have had a trial we cannot always anticipate what the effects upon the health of the workers will be. The results already achieved mark an important epoch in the history of medicine. They are seen in the improved health and social betterment of the working classes. Chemical research has lent its helping hand. Nothing has done more than medicine to foster the spirit of "international brotherhood," especially that branch of it in which we are all interested and which has for its object the utilisation of means for the prevention of accidents in mine and factory, also for making occupation healthy, and a source of adequate income and contentment to those who follow it.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE advance which has been made in the scientific application of photography is strikingly shown at the Exhibition of the Royal Photographic Society which opened its doors on Sept. 14th at 35, Russell-square, London. Though pictorial prints never fail to interest the artistic sense, it is in scientific work that photography finds its real usefulness, and in the camera research has found a most powerful ally. The scientific section of this exhibition, which is the seventieth held by the Society, is extremely well patronised; the entries include Radiographic Transparencies, Microradiographs, Telephotographs, as well as examples of Astronomical, Meteorological, Aerial, Spectrum, and Stereoscopic Photography.

The Radiographs of Captain T. W. Barnard, F.R.P.S., of Madras, are well worth study. This well-known worker has subjects ranging from "Exostosis of Scapula, Lateral Aspect" (No. 824) to "Finger Print" (No. 832). Captain Barnard has made an extensive study of this application of photography, and the extent to which he has perfected the process is shown in No. 829, which is an excellent piece of work and shows much technical skill. Two transparencies (Nos. 839 and 840) represent an "Artificial Pneumothorax for Tuberculosis," and are very well done. No. 826, "Stones in the Kidney," and No. 841, "Stone in the Bladder," are good renderings, especially the latter, in which the various densities are beautifully shown. The Radiograph prints by Mr. Henry T. Ferrier are excellent examples; his (No. 629) "Pelvis, Extensive Injuries" being particularly noticeable, as also is (No. 640) "Frontal View of Sinuses of Head," by Mr. A. O. Forder. Messrs. Kodak, Ltd., show eight prints in this section, all typical of the excellent work produced by their Radiographic section. Miss Honor M. Bright is to be congratulated on her (No. 643) "Pseudo Coxalgia at 13." The Microradiographs are by Mr. Pierre Goby, and include stereoscopic prints in relief and pseudo-relief and high magnification. Of these, Nos. 32 (under catalogue No. 800) and 17 (catalogue No. 801) are worthy of notice. The section for Photomicrographs is well supported as is usual at this exhibition, and we notice that Dr. G. H. Rodman is still as busy as when he was president. His work this year deals with the structure of the petiole of the Water Hyacinth, and a series of Idioblasts in various Water Lilies. The former, which includes eight examples from sections stained by hæmatoxylin and anilin acid green, are by transmitted light. No. 8 of this collection, which is numbered 644 to 647 in the catalogue, represents "Petiole expansion showing detail of the membranous wall of air spaces," and is a transverse section $\times 220$. This is done in Dr. Rodman's usual meticulous style, and is an excellent example of high-power photomicrography.

The section which promises, perhaps, to be of the greatest use to medicine is that showing specimens of photographs

transmitted over long distances in America by ordinary telegraph lines. A comparison of the original and the print made from the telegraphed message shows no apparent loss in detail, the only difference being that the reproduced picture is not quite so brilliant as the original. The process, apart from this defect, which would seem only to be a matter of technique, appears to be full of possibilities for the surgeon who has to make a diagnosis of a case a great distance away. The trade exhibits include a collection of microscopes with a photomicroscopic camera by Messrs. Watson of High Holborn, and the Home cinematograph apparatus of Messrs. Kodak and Messrs. Pathé of France. These latter demonstrate the ease of producing living pictures in one's own home.

The exhibition is to remain open until Oct. 24th.

A PLEASANT OFFICE.

WE have received a request from an officer of the Battalion to ascertain whether a medical man is willing to act in that capacity with Queen Victoria's Rifles (9th London Regiment). The duties would be to attend regularly one night a week from 8 to 9, the particular night being his own selection. He can dine at headquarters (56, Davies-street, W. 1) and can provide a substitute if absolutely prevented from attendance. Camp is approximately during the first fortnight in August, and though attendance is not essential, it is, of course, very preferable. In respect of pay and expenses there is a small capitation fee per man examined and pay in camp, while there is a grant on joining, representing the cost of uniform. Camp expenses are not covered entirely by the pay, but the mess subscription is three guineas, and other expenses are voluntary. We recommend a pleasant office to our readers, and applicants can address the Editor of THE LANCET.

WINTERING IN THE SOUTH.

WE are informed by the Office Français du Tourisme (56, Haymarket, London, S.W. 1) that the Paris-Orléans and Midi Railway Companies of France, in conjunction with the International Sleeping Car Company, have arranged to run the *train de luxe*, known as the Pyrénées Côte-d'Argent Express, permanently on and from Oct. 5th next. In connexion with the 11 A.M. departure from London (Victoria), a through sleeping car, Calais to Irun, will be attached to this train until Nov. 5th. The Pyrénées Côte-d'Argent Express will leave Paris at 8.40 P.M., and will consist of *wagons lits* (Paris-Biarritz, Paris-Irun, and Paris-Tarbes) and a restaurant car from Paris to Saint-Pierre-des-Corps. The Spanish Railways have agreed to maintain a permanent connexion from Irun to Madrid which, in addition to the usual restaurant car, will include a *wagon salon* of the Sleeping Car Company.

THE COUNCIL OF JUSTICE TO ANIMALS.

THE thirteenth annual report of this Council states that the cause of humane killing is making steady progress. The Society will lend instruments to any slaughterer willing to give them a fair trial, and has persuaded 150 councils to pass a by-law making the use of such killers compulsory. The Society also presents lethal boxes and "safeti" pistols to chemists, police officials, and other persons concerned with the destruction of unwanted or strayed dogs and cats. The work is not confined to this country, and France is rapidly adopting a killer called the *Harmon*, in preference to the mallet which often involves as many as ten blows. A Spanish society has been formed and aims at procuring legislation to protect domestic animals, establishing clinics for the animals of the poor, shelters for painless destruction, homes of rest for horses, and propaganda work. Particular success has been attained by the Tangier Society, and the Greek Society has been reorganised. The municipality of Rome have handed over the slaughtering of animals to the Society. The Committee appeals to the public to report cases of dogs kept chained up, to refuse to witness animal performances, to protest against menageries in local botanical gardens, to discourage the breeding of dogs suffering from respiratory complaints, and to demand humanely-killed meat at their butcher's.

THE Eugenics Education Society has removed to the new premises of the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C. 1. (Tel.: Museum 9640.)

WE have received a catalogue from the R. H. Heward Co., Crown-road Works, East Twickenham, which fully illustrates their large stock of surgical instrument appliances and bandages. The designs shown represent standard patterns, but the firm is willing to modify appliances as their clients may wish and is especially interested in the manufacture of special articles embodying some new idea or system. The goods illustrated include a selection of trusses, abdominal supports, chest protectors, suspensory bandages, and elastic hosiery.

A Dissertation: "DE MINIMIS."

By ARTHUR EDMUNDS, C.B., M.S. LOND.,
F.R.C.S. ENG.,
SURGEON TO KING'S COLLEGE HOSPITAL.

WHEN surgeons visit each other's operating theatres, they go not so much to discuss matters of great moment, as in the hope of picking up wrinkles and learning devices, often too trivial to form the subject for a paper, but yet of practical interest. This must stand as my apology for this paper, in which I have collected a number of such trivialities. These are often unpublished, either because their originator thinks they are too trivial to be worth noting, or because he is uncertain whether they are original or not.

What follows may be original or not, but it is a selection of practical devices which I have found out for myself; and their value is not lessened if others have done the same and employed them for years. I would like to suggest that other surgeons should follow this example and string together the seed pearls of their wisdom as well as the more important gems.

SOME PRACTICAL DEVICES.

1. On the Removal of Non-absorbable Intradermic Sutures.

Every text-book describes and illustrates very fully the method of putting in these sutures, but the method of taking them out receives less notice, and, in my experience, sometimes causes trouble. Cut the sutures close to one end of the wound. Next wring a fair-sized round swab out of lotion and press it firmly on the wound. Get a good grip on the stitch and pull firmly without jerking. The swab keeps the wound straight and prevents it wrinkling up and gripping the thread. Usually these sutures come out easily enough, but their removal is always facilitated by the wet swab, and I have been successful in removing the stitch quite easily by this device when repeated attempts to do so without had failed.

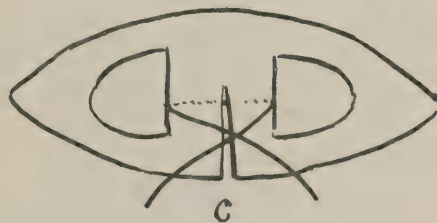
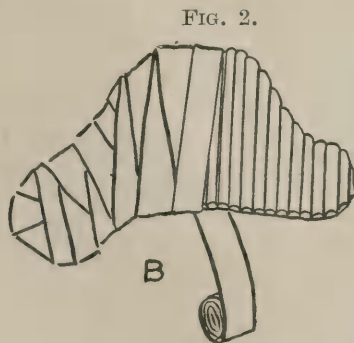


FIG. 2. Showing a method of keeping a dressing in place over a wound high up in the neck.

2. On a Suture for Cleft Palate.

Some years ago I described a vertical mattress suture which passed deeply through the tissues on both sides of the wound and then returned through the extreme margins of the incision so as to bring both the deep and superficial parts accurately together. I have used this suture extensively, but I have found one of its most valuable applications in the operation for cleft palate. It is quite easy to put in with Lane's needle-holder and gives a very satisfactory apposition of the muco-periosteal flaps (Fig. 1).

3. On Keeping a Bandage in Position for Wounds of the Neck.

The illustration (Fig. 2) shows a method of keeping a dressing in place over a wound high up in the neck. Immediately after the operation, while the patient is confined to bed, there is no objection to a bandage which goes over the vertex and round the forehead. When, however, the patient is allowed to walk about and go out of doors such a bandage becomes irksome, especially if it has to be continued for some weeks. Turns of bandage simply applied round the neck soon get into strings, the dressing slips, and the wound is uncovered. I have tried various devices to prevent this, such as sewing "collar supports" into the bandage, but I think on the whole the following is the best method.

A piece of ordinary corrugated cardboard is cut to such a length as will allow of its going two-thirds of the way round the neck, and of such a width and shape that it will nearly cover the dressing. For example, when the wound is high up in the neck the card will need a projection running up over the jaw. The cardboard is cut so that the corrugations are parallel to the long axis of the neck. This cardboard is carefully trimmed so that no sharp corners are left which might stick into the patient, and when it has been satisfactorily shaped, is covered by a few turns of bandage (Fig. B). The wound is dressed as the surgeon wishes and then the cardboard is applied to the outside and fixed in place with a few turns of the bandage (Fig. A).

Other materials besides corrugated cardboard can be used, but this material has the advantages of being cheap, light, easily obtained, and fairly rigid in the axis of its corrugation; and if care be taken to let the wool of the dressing overlap the cardboard just a little all round and to have no sharp corners, it

makes a very comfortable dressing. As it goes outside everything, there is, of course, no need to sterilise it.

The same principle can be used elsewhere; for example, I have kept a dressing over the root of the nose by means of a T-shaped piece of perforated celluloid, such as is used for intracranial work, the top piece of the T going along the forehead and the stalk of the T projecting along the nose. The whole was kept in position by a few turns round the forehead.

Sometimes it is useful to have the splint slightly concave. This is done by cutting the cardboard into

the shape shown in Fig. C with two D-shaped openings facing each other. Make a cut midway between the two D's and then pass a strip of bandage through the two openings and tie it at their lower part. This kinks the apparatus and makes it concave. In this case ordinary instead of corrugated cardboard is better.

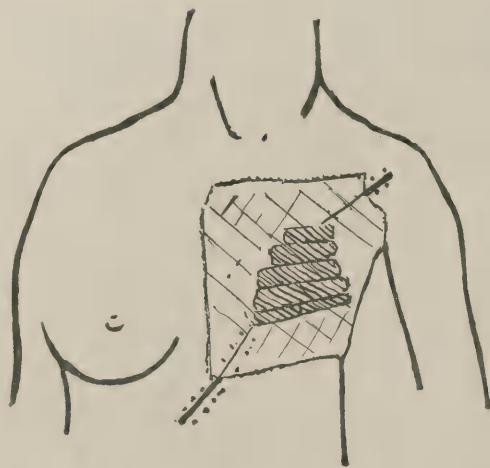
4. On a Nutrient Beef-tea.

Although milk is so nearly perfect as a fluid food, it is often desirable to have an alternative albuminous fluid food, for example, for patients who dislike milk.

Pound 2 oz. of fillet of beef in a mortar with 1 oz. of cold water, press the resulting paste through a wire sieve with the back of a wooden spoon or a vegetable presser. Return what comes through the sieve to the mortar. Pour into the mortar on top of the pounded meat 6 oz. of boiling bouillon, clear soup, or if nothing better is available, one of the commercial meat extracts. Stir this up and then pass it again through the sieve, which still has some particles of meat entangled in its meshes, which particles get washed through with the broth. The result is a reddish fluid which sets into a jelly after a few hours, and should measure about 8 or 9 oz.; that is to say, the whole of the 2 oz. of fillet of beef are contained in a tumblerful of liquid. The meat is very lightly cooked, but if the bouillon is skilfully prepared there is no raw taste. Other kinds of beef can be used, but they are inferior to fillet, as they contain more fat and fibrous tissue.

I have given this formula to Messrs. Withers, of 20a, Baker-street, who are prepared to supply this beef-tea to order, and as prepared by them it is an extremely palatable product. I have examined it microscopically and find that the beef is reduced practically to its ultimate fibres, and that many of these are actually broken up. Needless to say, this preparation will not keep and must therefore be freshly prepared daily.

FIG. 3.



A method of keeping Thiersch grafts in position.

5. On Keeping Thiersch Grafts in Position.

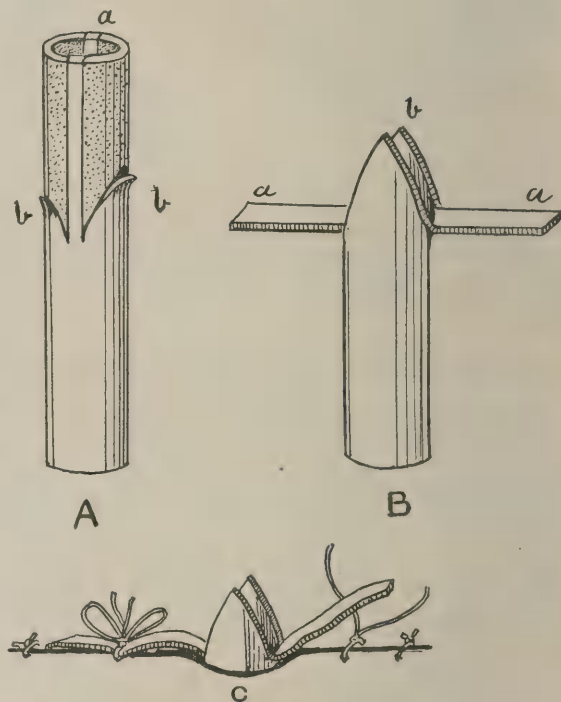
In Fig. 3 the condition is represented in which the left breast of a patient has been removed for carcinoma and it has been found impossible to bring the skin together. The darkly shaded portion represents the skin grafts which have been applied subsequently. After this has been done a piece of sterilised mosquito-netting is gently laid over the grafts, stretched out flat on the chest wall and fixed in position with collodion all round the wound. The collodion is not painted on to the grafts, but merely on the skin around them, the tension of the netting serving to hold the grafts down. Over this any dressings that the surgeon may fancy can be applied. If there is

much discharge this will escape through the mesh of the netting, and it will be found possible to renew the dressing without disturbing the grafts.

6. On the Insertion of Drainage-tubes.

It is important where a drainage-tube is to be inserted through a stab wound to see that the lines of the stab correspond with the lines of the cleavage of the skin or with the lines of tension of a flap. For example, after total amputation of the breast, if a drainage-tube is put in through a stab wound in the long axis of the body the hole will be dragged open and take a long time to heal. If, on the other

FIG. 4.



A drainage-tube for empyema.

hand, the incision for the drainage-tube is at right angles to the trunk the tension of the flap will tend to close it and it will heal rapidly. In putting a drainage-tube into the centre of an incision, for example after an operation for goitre, it is important to see that the edges of the incision lie evenly around the tube. The best way to do this is to put two sutures in the middle of the incision sufficiently far apart to admit the drainage-tube and so placed that there is exactly the same amount of skin above and below the incision. When the tube is removed the two edges fall together naturally, whereas if one had been a little longer than the other there would have been an ugly scar. After removing a tube, one sometimes desires to press the part to find out if there is any collection of pus within it. In the case of wounds of certain parts, for example of the neck, this can often be done by holding a swab against the wound and directing the patient to do the pressing for himself. Nervous patients appreciate this.

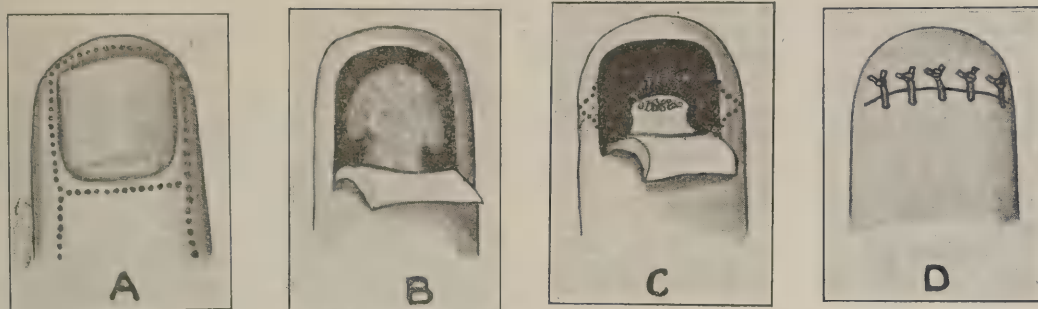
7. On a Drainage-tube for Empyema.

This is a slight modification of a device which I have already published. The drainage-tube of the desired length and size is cut as in Fig. 4, A, two oblique cuts mark out the angular flaps (b), and the ends of these two cuts are joined to the open end of the tube by two pairs of cuts, marking out the two long narrow flaps (a), the dotted part coming away, leaving a tube as shown opened out in B. The tube is put into position and a stitch passed through the edges of the wound on either side, its ends being

tied and left long. These long ends are then tied round the long flaps (a) holding the tube firmly in position. The triangular flaps hold the edges of the wound aside and prevent them from falling over the end of the

when healing is complete, a painless rounded stump well calculated to bear pressure. Sometimes two little ear-like processes will be formed on either side of the incision. These can be removed

FIG. 5.



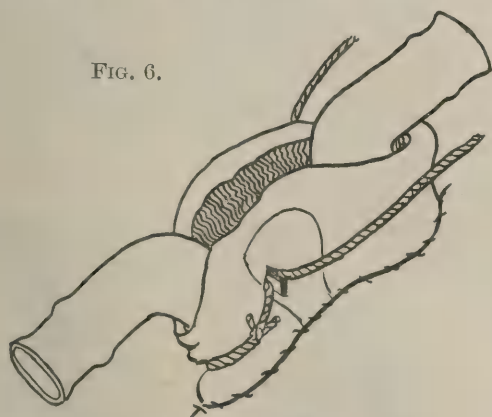
A method of removing finger- and toe-nails.

tube. To remove the tube the bows are untied, the tube washed, replaced, and the bows retied (C). The sutures hold for a week or ten days, at the end of which it is usually easier to retain a tube of the ordinary pattern.

8. On Removing Finger- and Toe-nails.

The operation of removing a nail is usually called "avulsion," a term which suggests violence. The

FIG. 6.



Showing the colotomy tubes in position.

best way to do this little operation is to use a thin flat-bladed blunt dissector; the one sold under the name of MacDonal's raspator is an excellent one. This is gently insinuated under the nail and moved from side to side so as to gradually separate the nail from its bed. The nail can then be lifted up and removed with a minimum of laceration of the underlying structures, and, consequently, a more rapid and less painful healing. The operation takes a little longer; but as the patient is, or should be, always under an anæsthetic this is of no importance.

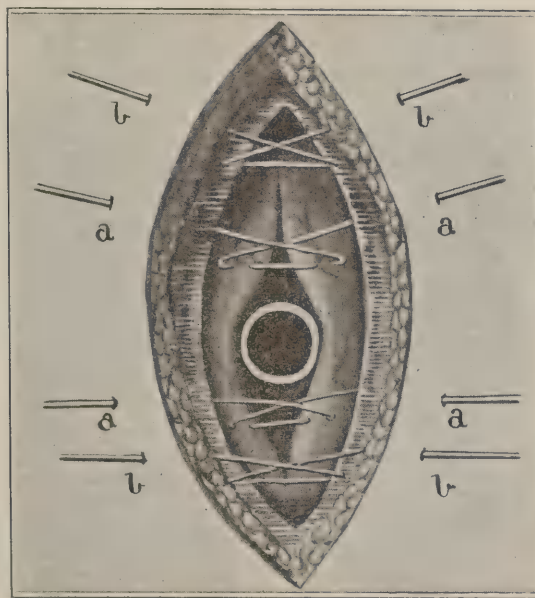
In some cases, for example when the nail of the great toe is enormously overgrown, it is necessary to remove it completely, matrix-bed and all. The method illustrated in Fig. 5 will be found useful. The incisions are made as in A, surrounding the nail and running up on the phalanx for about half an inch. The little flap over the nail-bed is then dissected up and the nail-bed matrix and nail excised, leaving the terminal phalanx covered with a little fibrous tissue at the bottom of the wound as shown in B. The expanded end of the terminal phalanx is then cut off with a pair of bone forceps, leaving the condition shown in C. It is now quite a simple matter to sew up the whole wound completely as in D, leaving,

by excising two little triangular flaps of skin as indicated by the dotted line in C. If the reflected flap over the matrix should prove to be too thin at its edge, this can be trimmed away.

9. On Inguinal Colotomy.

I practically always open the bowel in this operation immediately after fixing it in the wound. I carefully suture the bowel and the intervening mesentery to the skin with fine catgut and then pass two stout silk ligatures through the mesentery without interlocking them. I then pack round the bowel with gauze wet in 1 in 2000 perchloride of mercury to protect

FIG. 7.



Suturing of bladder and abdominal wall after prostatectomy.

the wound. I next slit open the bowel, as shown in Fig. 6, clean it out, and pass a colotomy tube into each end. I then tie the two sutures one round each of the colotomy tubes and the bowel as tightly as possible, so as to hold them in position and completely avascularise the tissue beyond the ligature. As my hands are now soiled I remove my gloves, take away the wet gauze, and replace it by a cyanide gauze dressing wrung out of 1 in 40 carbolic acid. Colotomy

tubes of india-rubber are tied over the glass tubes in the usual way. At the end of a week both tubes and the intervening piece of bowel separate cleanly without any hæmorrhage and a very satisfactory colotomy is obtained.

10. On the Use of Figure-of-8 Suture after Prostatectomy.

After removing the prostate I am in the habit of closing the wound around the drainage-tube as follows. A stout silkworm-gut stitch is passed through the muscular wall of the bladder on either side of the incision, avoiding the mucous membrane (Fig. 7 (a)). This is done above and below the tube, and the cut edges of the bladder are inverted around the tube. The sutures are then crossed and passed through the whole thickness of the abdominal wall—that which came from the right side of the incision into the bladder coming out on the left side of the incision in the skin and vice versa, so that when these are tightened up the bladder incision is turned in and the whole of the abdominal wound is approximated. But more superficial figure-of-8 sutures, as many as may be necessary, are put through the sheath of the rectus, crossed, and passed out through the skin (Fig. 7 (b)). When all these are tightened the abdominal wall is held well together, the edges of the bladder incision are inverted, and the bladder held well against the deep surface of the wound. These sutures are cut on the thirteenth day and removed on the fourteenth, thus leaving no buried sutures to cause trouble.

SOME PRACTICAL POINTS ON THE OPERATIVE SURGERY OF THE GALL-BLADDER.

1. In order to bring the biliary passages into a more accessible position, it is usual by some means or other to extend the spine into an arch, the summit of which is at the lower dorsal vertebra. This may be done either by placing a firm sandbag or a pneumatic

the spine in the lower dorsal region, but with much greater comfort. It is shown in Fig. 8.

After the patient has been laid upon the table he is lifted up almost into a sitting position, and firm pillows or sandbags are pushed tightly up against the lower part of the spine and banked up as far as the lower dorsal region. The patient's head and shoulders

FIG. 8.



Position of patient on the operating table.

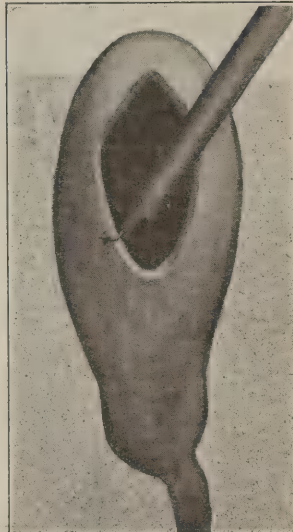
are then allowed to fall back to the horizontal position and supported by further pillows. In all, about half a dozen are required. It will be noticed that not only is the angulation secured but that the abdomen is acutely inclined, making an angle of about 45° with the horizontal, so that on opening the abdomen the small intestines drop away to the pelvis and do not intrude upon the field of operation. It is only necessary to persuade a few normal, conscious individuals to try this position and compare it with the older ones to demonstrate how much more comfortable it is. Further, anaesthetists tell me it is a better position from their point of view, as it interferes less with the freedom of respiration. I have used this method now for a long time and have found that it gives good access with all the various incisions for exposure of the gall-bladder. I may mention, in passing, that, like many surgeons, I now usually attack this region through a paramedian incision.

FIG. 9.



The line of the incision through the peritoneum over the gall-bladder.

FIG. 11.



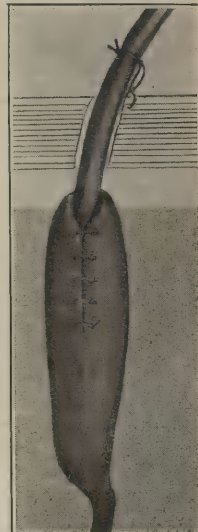
Incision into the gall-bladder with drainage-tube sutured to its margin.

FIG. 12.



Schematic view of the inside of gall-bladder as it would appear if viewed from the hepatic surface.

FIG. 13.



The drainage-tube in its final position.

pillow behind the patient in the lower dorsal region, by a "bridge" on the operating table, or by using a specially arranged operating table. All these positions are extremely uncomfortable to a conscious patient and are therefore a factor in producing discomfort after the operation. The method I have employed obtains exactly the same angulation of

2. In view of the accidents which have happened to the common duct in excising the gall-bladder, it is taught in most text-books that the dissection should commence over the cystic duct. In a thin patient, with a small gall-bladder, with lax hepatic ligaments, and a broad subcostal arch, this procedure is as easy as it appears to be in the illustrations in the

books on operative surgery. Unfortunately, however, a very large number of these cases are extremely fat, the gall-bladder is enlarged, obscuring the ducts, so that this method is difficult; and in such cases, even when it is possible, it can only be done by using a good deal of undesirable force. It is recommended in such cases that the gall-bladder should be aspirated before removal. In some cases this is, in my opinion,

FIG. 10.



The separation of the gall-bladder completed.

very undesirable and also unnecessary. The statement is made that it is almost impossible to remove the gall-bladder by commencing the separation from the liver at its fundus and at the same time to see distinctly the structures which are ligatured in the neighbourhood of the foramen of Winslow.

In such cases it is generally fairly easy, by incising the peritoneum, to separate the gall-bladder from the liver (Fig. 9), starting at the fundus, care being taken, of course, to carry out the dissection at the proper level, and avoid lacerating the liver or the gall-bladder. The liver can now be held up by a retractor and a gauze pad packed over the raw area of the liver to control the hæmorrhage, if this is sufficient not to interfere with the operation. As a matter of fact, it is very rare that this is the case. The fundus of the gall-bladder is grasped, either with a piece of gauze or, if it is sufficiently lax, with a pair of ring forceps, and drawn downwards towards the right iliac fossa (Fig. 10). The incision between the liver and gall-bladder is then extended through the peritoneum from the lowest point on one side, transversely to the long axis of the gall-bladder until it meets the incision on the other side. It is immaterial whether this transverse part of the incision lies over the duct or over the lower part of the gall-bladder itself. This division of the peritoneum is quite easily carried out, provided that the peritoneum is drawn taut and a sharp knife is used. With a little blunt dissection it is now quite easy to push down the peritoneum between the transverse incision and the common duct.

The gall-bladder is now connected only by its duct and its blood-vessels with a small amount of areolar tissue between. The cystic duct is separated from the remainder of the pedicle and traced downward as far as the surgeon thinks desirable. An aneurysm needle is passed around the remainder of the pedicle—that is to say, around the vessels, which are ligatured and divided—care being taken to leave a sufficient amount of tissue on the far side of the ligature to prevent it slipping off. The gall-bladder is left connected merely by the cystic duct which is ligatured and divided in the usual way. If the common bile-duct has not been exposed before, it is easy at this stage to do so, making gentle traction on the cystic duct and pushing the divided peritoneum aside.

To separate the gall-bladder from the liver, starting from the fundus and then to tie a string more or less blindly around a pedicle is certainly a dangerous procedure; but by this method we gain the advantage of a mobile gall-bladder and at the same time one can see exactly what is being ligatured. Even when the transverse incision is made across the lower part of the gall-bladder it is usually quite easy to expose the whole of the cystic duct. Furthermore, if one has the consciousness that the duct has been well and truly ligatured a small escape of bile along the drainage-tube for the first 24 or 48 hours does not give the surgeon any apprehension that his ligature has slipped, as it will be evident that this escape is merely due to the lacerated bile-ducts on the surface of the liver.

3. Drainage of the gall-bladder is an operation less frequently performed to-day than formerly, but there are certain cases in which it is necessary. Some surgeons recommend the suture of the wall of the gall-bladder to the deeper part of the abdominal wall, while others recommend that a tube should be inserted and fastened in with a purse-string, the object of the purse-string being to invert the walls of the gall-bladder as the walls of the stomach are invaginated in a Kader's gastrostomy, so that when the tube is removed the gall-bladder will close rapidly.

Bickham recommends that when the incision into the gall-bladder is slit-like a few points of Lembert's sutures should be inserted and the drainage-tube brought out at the middle of the incision. The purse string method is very easily applicable when the gall-bladder is distended and has lax walls, but it is difficult to carry out in a contracted gall-bladder with thickened walls, especially if a large opening has been made in the gall-bladder in order that the surgeon may explore its interior with his finger, a procedure which, as Rutherford Morison says, should always be carried out. It is a good plan not to incise the gall-bladder actually at its fundus, but starting at a point about half an inch from its attachment to the liver, to carry the incision upwards as far as may be necessary to insert the finger, remove the stones, and clear the ducts (Fig. 11). A drainage-tube about the size of a No. 12 catheter with several holes cut in its side is then pushed along the gall-bladder towards the cystic duct and a non-absorbable suture passed through the gall-bladder and tube. This suture is tied as tightly as possible, so that it will, in the course of a few days, cut through the tissues of the gall-bladder and liberate the tube, with which it ultimately comes away. The incision in the gall-bladder is then closed by several layers of Lembert's sutures, as many rows being inserted as possible, care being taken to tuck in the edges of gall-bladder between the tube and the liver. The greater the amount of enfolding the more certainly will the gall-bladder fall together when the tube is removed and the less risk is there of the formation of a biliary fistula (Fig. 12). The latter figure is a schematic diagram of the incision so sutured, viewed from within.

It is my experience that the discharge of bile in these cases ceases in 24 hours. The drainage-tube leading from the gall-bladder is brought out through the abdominal wall at a convenient point and fastened in position. To do this a silk-worm-gut suture is

passed through the skin and tied securely, but not too tightly. The loose ends are again tied together in a reef knot about half an inch from the skin, and the ends are now tied firmly round the drainage-tube (Fig. 13). The drainage-tube can be held very firmly in this way and it will take an appreciable tug to pull it out. Furthermore, by securing the drainage-tube in this way the lumen of the tube is not opened and the bile does not leak into the dressing, but runs away into the receptacle provided for it.

INSTRUCTION OF STUDENTS.

In order to make diagrams at the bedside I have had made for me sketch blocks of "poster paper" upon which I draw either with a carbon pencil or a "BB" carpenter's pencil, as sold by Winsor and Newton. To demonstrate cutaneous sutures I use spongiopiline. This is a sort of felt on one side of which is a black waterproof layer which represents the cuticle very well. If this is pinned on a black-board incisions can be made into it and sewn up with thick white silk for class demonstrations. To illustrate plastic operations I use stockinette dress material, which is fastened loosely with drawing pins over a frame. Lines can be drawn on this with soft chalk, and sliding flap and other plastic operations can be readily carried out. The best material for the sutures is the thick real silk which is sold for knitting purposes. For demonstrating intestinal operations I employ a tube made of two thicknesses of flannel—the inside red flannel and the outside white flannel. With this all the ordinary methods of intestinal anastomosis can be quite readily demonstrated.

A CLINICAL STUDY OF DIABETIC COMA.*

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THE following 11 cases are recorded as illustrating some aspects of this complication which are worthy of note, and have a bearing on its present-day treatment.

CASE 1.—P. M., aged 25, male. Admitted under the care of Dr. A. P. Beddard. No history of illness till three weeks before admission. A sore-throat, thirst, and weakness were then noticed, and diagnosed by his doctor as influenza. The thirst and weakness increased, and some polyuria developed; he became constipated, and on the day before admission was drowsy. On admission he was semi-comatose and "dyspnoeic," with a pulse of 110 (no note as to volume). The treatment and progress for the first four days are shown in Table I.

TABLE I. (Case 1.)

Date in Feb., 1924.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar.	Acetone bodies (FeCl ₃).	Albumin.	Fluids.	Insulin units.
6th	0.54	—	10 + C||	++	++	+	—	50
7th	0.147	0.063	20 + C	+++	++	Nil	See below.	60
8th	—	—	34	—	—	—	—	60
9th	0.09	—	94	—	—	—	—	45

^{||} C = One catheter specimen, volume not measured.

Fluids.—6th, 7th: 15 oz. hrly. gluc. and bicarb. rectally and mouth. 8th: Solid food started.

He was discharged "sugar-free" on 25 units of insulin night and morning, and on a fairly liberal diet.

Four months later he was readmitted for investigation. With no alteration in his diet and without insulin he remained sugar-free, and his blood-sugar at 5.30 P.M. was 0.135 per cent. He was discharged on a diet without insulin.

* The chief points in this paper were communicated to a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine.

Notes.—Urine: There appears to have been a distinct drop in the volume of urine passed at the onset of coma, since he had been passing large quantities just before. Notwithstanding the considerable quantity of fluid given diuresis did not occur for two days, and then coincided with a complete return to consciousness. Blood-urea: On the second day, when the patient had almost recovered, the blood-urea was still twice the normal value. Subsequent history: This case is remarkable in that so severe a case of diabetes, requiring 50 units of insulin daily to keep the urine sugar-free, should have recovered to such a degree as to permit the omission of insulin, at any rate for the time being.

CASE 2.—E. K., aged 18, female. Admitted under the care of Dr. H. French. History of diabetes for two and a half years, treated by diet. Fourteen days before admission the patient complained of a sore-throat and became constipated. An enema was followed by some improvement. Two days before admission patient collapsed and vomited. The next day there was no improvement, vomiting continued, and there was much thirst. On the day of admission she became dazed, and when admitted she was comatose with some delirium, the respirations were deep and quick, and the pulse rapid and feeble. Treatment and progress are shown in Table II.

TABLE II. (Case 2.)

Date in Sept., 1924.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar %.	Acetone bodies.	Albumin	Fluids.	Insulin units.
7th: 8 P.M.	0.69	—	7	3.5	++	+	See below.	40
12 P.M.	—	—	4	—	—	—		40
8th: 8 A.M.	—	—	10	2.9	+	—	—	80
4 P.M.	—	—	4	3.5	++	—	—	60
12 P.M.	—	—	Nil	Tr.	—	—	—	20
9th: 8 A.M.	—	—	1/2	Tr.	Nil	+	—	Nil
4 P.M.	—	—	?	Tr.	—	—	—	Nil
12 P.M.	0.45	—	Nil	—	—	—	—	Nil
8 A.M.	—	—	2	Tr.	Nil	+	—	Nil
4 P.M.	—	—	4	—	—	—	—	—
12 P.M.	—	—	Nil	—	—	—	—	20
11th: 8 A.M.	0.50	0.198	4	F. tr.	Nil.	+	—	40

F. tr. = Faint trace.

Fluids.—7th: 25 oz. sodii bicarb., 50 oz. gluc., intrav. 8th: 20 oz. sodii bicarb. and gluc. 2-hrly. by nasal tube. 9th: 20 oz. gluc. intrav. 10th: 20 oz. fluid, 2-hrly., rectally.

Remarks.—7th: Comatose and vomiting. 8th: (8 A.M.) Conscious; (4 P.M.) still vomiting; (12 P.M.) comatose again. 9th: (8 A.M.) Sweating; (4 P.M.) air hunger, hot skin; (12 P.M.) vomited. 10th: No air hunger. 11th: Air hunger; commencing gangrene right big toe; (4 P.M.) died.

Post-mortem examination showed no naked-eye abnormalities in heart, lungs, kidneys, &c., but gangrene and perforation of the ileum had occurred, and there was some pus in the pelvis.

Notes.—Urine: A marked feature in this case was the oliguria. Although the blood-sugar was extremely high, only traces of sugar were passed in the last 73 hours. Albumin was constantly present. The absence of acetone bodies was probably due to the inability of the kidney to excrete them (vide Case 8). Blood-urea: The significance of so high a figure is doubtful, as the patient was moribund, in which condition a high blood-urea is sometimes found.¹⁸ Vomiting: It is extremely difficult to assess the diagnostic importance of this persistent vomiting. It occurred in three other cases of coma (Cases 6, 10, and 11); but in view of the post-mortem findings it is impossible to rule out an intra-abdominal cause, although it is probable that the gangrene and perforation of the ileum was a terminal event comparable with the gangrene of the toe.

CASE 3.—L. B., aged 19, male. Admitted under the care of Dr. Beddard. History of diabetes for one and a half to two years. He had been having 5 units of insulin daily for the five months previous to his admission. On the day preceding admission the insulin was omitted and he had a tooth extracted. By the next day he was comatose, and when admitted there was definite air hunger. The treatment and progress are shown in Table III, with the exception of the fluid given, notes of which are available for the first 24 hours only. During this time 10 oz. saline, containing sodii bicarb. and glucose, were given every hour by nasal tube, and 20 oz. saline subcutaneously and 40 oz. saline rectally.

When discharged the patient was having 25 units three times a day, with a diet containing 2 oz. potatoes and 3 oz. bread. When seen six months later, apparently on the same régime, his blood-sugar was 0.28 per cent., and 120

units of insulin a day were required to render his urine sugar-free. When last seen in March, 1925, he was in excellent health, and his blood-sugar was 0.15 at 2 P.M. He was having only 50 units of insulin a day.

TABLE III. (Case 3.)

Date in 1924.	Blood.		Urine.				Units of insulin.
	Sugar %.	Urea %.	Vol. oz.	Sugar.	Acetone bodies (FeCl ₃).	Albumin.	
Oct. 25th	—	—	17 (C)	—	—	—	140
" 26th	—	—	40 (C)	1.25 %	+	++	200
" 27th	0.106	0.15	27 (C)	Nil	—	++	25
" 28th	—	—	45	+	+	+	30
" 29th	—	—	30	Tr.	(+)	+	45
" 30th	0.408	—	?	+	Tr.	Nil	45
" 31st	—	—	104	++	Nil	—	55
Nov. 6th	0.269	0.032	76	—	Nil	Nil	120

(C) = Catheter specimen.

Remarks.—Oct. 25th: Coma. 26th: Drowsy. 27th: Hypoglycæmia. 28th: Drowsy. 29th: Earache and aural discharge.

Notes.—Urine: A certain degree of oliguria is to be noted, and diuresis did not start for five or six days, the patient having completely recovered from the coma. Albumin was present until diuresis started. Blood-urea: Even on the third day the blood-urea was over five times the normal value. With complete recovery the blood-urea returned to normal. Coma: In this case although some sugar was given, at the end of 48 hours signs of hypoglycæmia appeared (noisy delirium, sweating, full pulse). On omitting insulin, within 24 hours the patient became drowsy again, as if diabetic coma were impending. Insulin treatment was restarted, less being given than before, and in a few days the effects of the coma had quite cleared up.

CASE 4.—L. S., aged 15, female. Admitted under the care of Dr. Beddard. History of two months' weakness. Tubercle being suspected, the patient was sent to a sanatorium about a week before admission to Guy's. While there she "caught a cold" and became tired and drowsy. She was sent home, and the next day she was admitted almost comatose with air-hunger. (Table IV.)

TABLE IV. (Case 4.)

Date in 1924.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar %.	Acetone bodies.	Albumin.	Fluids.	Insulin units.
August 27: 9.30 P.M. . .	0.36	N.N.	—	—	—	—	See below.	30
August 28th: 10.30 A.M. . .	0.24	—	32	4	++	+		90
" 6 P.M.	0.076	—	20	—	—	—	—	30
August 29th: " 30th. . .	—	—	64	—	—	—	—	45
Sept. 1st	—	—	80	Nil	++	Nil	—	45
Sept. 18th: 5.15 P.M. . .	0.12	—	?	Nil	Nil	Nil	—	40

N.N. = Nearly normal.

Fluids.—August 27th: 20 oz. gluc. and NaHCO₃; stomach-tube. 28th: Fluids ad lib.; no record of quantity.

Remarks.—August 27th: Coma. 28th: Recovered consciousness.

Notes.—Urine: Slight oliguria is to be noticed. Albumin appears to clear up about the same time that the volume of urine increases. Coma: Although no symptoms of hypoglycæmia were noted, it is evident from the blood-sugar that within a few hours of coming out of diabetic coma the patient is close on an insulin reaction.

CASE 5.—R. E., aged 17, male. Admitted under the care of Dr. Poulton. History of one week's illness, starting with a sore-throat. On admission he was semi-comatose. He had well-marked air-hunger, but his pulse was good. (Table V.)

He was discharged Nov. 13th, 1924, in good health, having 50 units of insulin and an adequate diet. Six months later the urine was sugar-free, and the blood-sugar at 1 P.M. was 0.13 per cent., while he was taking 8 units of insulin at night.

TABLE V. (Case 5.)

Date in Sept., 1924.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar.	Acetone bodies.	Albumin.	Fluids.	Insulin units.
24th: 12 P.M.	0.55	0.06	128	+	++	+	See below.	110
25th: 1 A.M.	0.19	—	164	—	—	—		40
" 2-5 P.M.	0.12	—	—	—	—	—		35
26th	—	—	88	+	Tr.	—	—	—

Fluids.—24th: 100 oz. Saline by mouth for 5 hours. Vomited and fluids discontinued for 5 hours. 25th: 200 oz. Saline NaHCO₃ by nasal tube.

Remarks.—24th: Coma. 25th: Regained consciousness.

Notes.—Urine: No oliguria was present in this case. This probably is associated with the unusually good pulse. Blood-urea: Was twice the normal value, notwithstanding the quantity of urine secreted.

The subsequent history of this case is of interest. He was admitted in May, 1925, passing sugar and a fresh régime was arranged, but he did not keep to his diet. At the end of August he went to bed feeling unwell (no other details obtained), but got up on Sept. 4th, went out, and apparently ate unrestrainedly. He took no insulin that night, and the next day he was sleepy, and insulin was again omitted. Early on the 6th he was readmitted very drowsy, but able to answer questions. Energetic treatment was at once started, but in spite of 160 units of insulin and much fluid he died in a few hours. His blood-sugar shortly before death was 0.49 per cent. He passed no urine after an initial catheter specimen. Post mortem his bladder was empty and the kidneys were large with some fatty changes. No other abnormalities were found.

CASE 6.—M. J., aged 17, female. Admitted under the care of Dr. Beddard. Two or three months' history of lassitude, thirst, loss of weight and poor appetite. On the evening of the day preceding admission she suddenly vomited and became drowsy. The vomiting continued, and the drowsiness increased; on the next day she was admitted completely comatose, with deep but not rapid breathing. (Table VI.)

TABLE VI. (Case 6.)

Date in 1924.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar.	Acetone bodies.	n.	Fluids.	Insulin units.
May 27th	—	—	42	+++	+++	—	See below.	80
" 28th	—	—	?	—	—	0.1 %		45
" 29th	0.245	0.024	?	—	—	—	—	15
May 31st	0.243	—	40	—	—	Nil	—	40
June 20th	0.09	0.013	—	—	—	—	—	60

Fluids.—May 27th: 60 oz. per rectum, "several pints" by mouth of saline, with glucose and NaHCO₃.

Remarks.—May 27th: Coma. 28th: Recovered consciousness. 31st: Aural discharge noted June 6th.

The patient was discharged some weeks later quite fit on a diet and 60 units of insulin a day.

Notes.—Urine: The absence of reliable figures prevents any remark on the volume. Albumin was present and disappeared on the complete recovery of the patient.

CASE 7.—I. M., aged 16, female. Admitted under the care of Dr. Poulton. Admitted in coma. She did not regain consciousness, and died the next day. No record as to history was obtained. (Table VII.)

TABLE VII. (Case 7.)

Date in Sept., 1924.	Blood.		Urine.				Units insulin.
	Sugar %.	Urea %.	Vol. oz.	Sugar.	Acetone bodies (FeCl ₃).	Albumin.	
7th	0.5 +	0.135	?	+	(+)	—	40
8th	—	—	?	++	Nil	—	120

Remarks.—7th: Coma. 8th: Death.

Note.—The main points of interest in this case are the high blood-urea a day before death, and the very small amount of acetone bodies in the urine.

CASE 8.—E. P., aged 29, female. This patient is Case 6 in a previous publication (THE LANCET, p. 777, 1923). Her history dates back two years. She had been having insulin treatment at home for some months. She was there seen by one of us in consultation with Dr. Wilson. She was then tired and had a bad cold. No sugar was found in the urine, and insulin had been omitted. Insulin was given again. The next day she became drowsy and had pains in her back. Sugar and acetone bodies appeared in the urine. On the following morning there was more drowsiness and some exophthalmos, and in the afternoon the patient became comatose and the breathing deep. Insulin continued to be given, but no urine could be obtained. A lumbar puncture was performed. Some improvement resulted which continued for some days, although there was some vomiting. A specimen of urine was obtained by catheter at the time of the lumbar puncture. The patient died a few weeks later, but no details were obtainable. (Table VIII.)

TABLE VIII. (Case 8.)

—	Vol.	Sugar.	Acetone bodies.	Urea.	—
Blood ..	—	0.46	—	—	—
Urine ..	?	Nil	Nil	—	—
C.S.F. ..	14 c.cm. removed.	—	FeCl ₃ + Legal ++	0.15 %	Cells 0. Protein 0.05 %

Notes.—The striking points in this case were: (1) The high blood-sugar with no sugar in the urine. (2) Acetone bodies present in the C.S.F., but absent in the urine. (3) The high urea content of the C.S.F. (4) The pronounced oliguria.

CASE 9.—O. B., aged 19, female. Seen by one of us in consultation with Dr. H. P. Warner, of Woodford Green. Two years' history of malaise. Thirst was noticed two weeks previously, and four days previously the urine was found to contain 7 per cent. sugar, when the diagnosis of diabetes was made. She became drowsy early in the day, and by the evening was in coma. No urine was passed during the day. Sixteen months later she required 42 units of insulin a day, and with this the blood-sugar was 0.17 per cent., and the urine nearly always sugar-free. (Table IX.)

TABLE IX. (Case 9.)

Date in Dec., 1923.	Blood.		Urine.				Treatment.	
	Sugar %.	Urea %.	Vol. oz.	Sugar	Acetone bodies.	Albu-min.	Insulin.	Fluids.
14th	0.45	0.077	13 (cath.)	1 %	+++	+	50 units at once, 30 units 4-hrly.	See below.
15th	—	—	60	—	—	—	—	—
16th	—	—	70	—	—	—	—	—
17th	—	—	65	—	—	Nil	—	—

Fluids.—14th and 15th, 40 oz. saline with glucose and NaHCO₃, by nasal tube every hour.

Notes.—This case shows the preliminary oliguria with albumin in the urine and a raised blood-urea. With the onset of diuresis the albumin disappeared.

CASE 10.—K. A., aged 20, male. History of diabetes for two years. He was living at home on a protein-fat-vegetable diet, and was having 45 units of insulin a day. On this he was keeping very well, and was able to do all the work he wished to. On Wednesday, July 16th, 1924, he caught a chill and went to bed. He was still in bed on Friday, and he started to vomit. Insulin had been given as usual up to Friday morning, when it was omitted. On Friday night 30 units of insulin were given with some sugar, as he was drowsy. He died early Saturday morning. No other details were obtainable.

CASE 11.—J. W., aged 11, female. This child had had diabetes for about two years, and had done very well with insulin treatment at home. Her dose was 8 units in the morning and 16 units at night. On Thursday, July 31st, 1924, she had a temperature and was put to bed. Insulin was given as usual. On Friday she had a fluid diet and only 4 units of insulin. On Saturday the temperature became normal, but vomiting commenced and there was some air-hunger. The diet was still restricted to fluids and insulin was omitted. On Sunday some morphia was administered and the vomiting, which had been very persistent, ceased. At 8 A.M. she received 16 units of insulin, as there was much glycosuria. At midday 20 units of insulin and a rectal injection of glucose and sodii bicarb. were given, followed by 16 units of insulin and rectal glucose four-hourly, bringing the total amount of insulin to 68 units. On Monday she

received 32 units of insulin, but became semi-comatose and her pulse began to fail. As she appeared to be in pain morphia was again administered. Death occurred at midday.

Notes (Cases 10 and 11).—There is a certain similarity in these two cases. In both a febrile attack was followed by vomiting, coma and death, and in both the dose of insulin was diminished. In both cases, when ultimately the seriousness of the condition became evident, the correct treatment of insulin and sugar was started, but in neither case were the quantities of insulin and fluids given as great as were found necessary in the cases treated in hospital.

Discussion.

Length of History.—Cases 1, 4, and 5 show the remarkable acuteness of onset of which diabetes is capable, the illness apparently dating back only seven days in Case 5.

Age.—In our series 9 of the 11 were between 11 and 20 years old, the remaining two being 25 and 28. This, however, is hardly a fair representation of the age-incidence of coma as the literature abounds with cases between 30 and 60, usually terminating a fairly long history of diabetes mellitus.

Onset.—The apparent cause of onset in many of our cases was a febrile disturbance such as a sore-throat or a cold. In three cases (3, 10, and 11) who were receiving insulin, coma started within a day of omitting insulin, either on account of a febrile disturbance or operative interference. Vomiting also appears often to precede coma (Cases 2, 6, 10, 11), this symptom occurring fairly frequently in histories of many reported cases.

Renal Element.—The renal element in diabetic coma appears to have escaped attention during the last few decades. Recently several investigators have recorded cases in which some renal failure is evident. Warburg¹ in particular has reported four cases and reviewed the literature with reference to diabetic coma as far back as 1844, when Bouchardat recorded two cases of diabetes who died in coma. In both of these before the onset of coma the urine contained much sugar, but during the 24 hours preceding death the urine contained no sugar. Between that date and 1897 there are many cases recorded in which diabetics died in coma with either anuria, or oliguria, or albuminuria with or without casts. The first record of definite urea retention in a case of diabetic coma was in 1868, when Colin notes that the blood from the veins at post-mortem contained a definite excess of urea. More recently Rosenblom,² Joslin,³ Höst,⁴ Rahlff,⁵ Paddock⁶ have recorded cases of coma in which the urine, while containing sugar, failed to show any ketone bodies; albuminuria was present in almost all cases. Mördre⁷ has recorded a case in which the urine showed the presence of sugar and albumin with absence of ketone bodies, and in which the blood-urea was much raised, and Imrie and Skinner¹⁰ record a similar case with anuria and a raised blood-urea.

These cases, except Warburg's and Imrie's and Skinner's, were treated before the days of insulin, and they all died, with the exception of Rahlff's case and two of Warburg's. The latter two cases showed some oliguria, albuminuria, absence of ketone bodies, and a raised blood-urea. The albuminuria disappeared and the blood-urea returned to normal with recovery. In Warburg's two fatal cases ketone bodies were absent from the urine. Brunton¹¹ has recorded two cases of diabetic coma successfully treated, in one of which there was a raised blood-urea which returned to normal. He also examined the blood-urea of several other diabetics not in coma and found figures within the normal range. No note as to the urine was made.

In a somewhat different category are the cases recorded by McCay and his co-workers.¹² He found that the Bengali leading a sedentary life and becoming obese was afflicted with a mild type of diabetes which often terminated in coma. He examined a number of cases and found a marked urea and non-protein nitrogen retention. The blood-sugar was raised. The urine showed albuminuria and casts and contained

only small amounts of sugar, while the ketone bodies were present in traces only or were absent.

These cases were uniformly fatal, and McCay regards them as dying of uræmic coma following a prolonged deterioration of the kidney, but he had no opportunity of examining them before they were admitted in the early stages of coma, and apparently no microscopical examination of the kidneys was made. They may well have been, therefore, cases of diabetic coma with terminal renal failure.

An examination of the nine cases observed by us affords further evidence of the part played by the kidney in diabetic coma. In six cases oliguria was certainly present, and in eight cases there was albuminuria. The blood-urea was measured at the time of coma in seven cases, and in six of them it was abnormally high. Three of the cases (2, 7, and 8) observed by us terminated fatally in spite of insulin treatment, and in these the blood-urea ranged from 0.135 to 0.198 per cent. In only one case that recovered was such a high value found. In two of the fatal cases (2 and 8) the severe degree of renal failure was suggested by two further facts: (1) in spite of a very high blood-sugar, sugar was absent from the urine or present in traces only at some time during the coma; (2) the urine contained no acetone bodies.

In all the cases recorded up to date in which the urine showed no ketone bodies their presence in the body fluids has been assumed. In Case 8 this evidence was obtained by examination of the cerebro-spinal fluid. It has been shown also in a previous paper¹³ that the kidney in coma does not concentrate ketone bodies as well as it does when coma is not present. (Table II. of the latter paper shows that in Cases 3 and 5 the concentration of ketone bodies in the urine was about ten times that of the blood, while in Case 4 in coma the concentration in the urine was only two or three times that of the blood.)

The cause of the renal failure is by no means clear. It is usually considered that the kidney, in common with other organs, is poisoned by the ketone bodies, and in particular by aceto-acetic acid. While this poisonous action undoubtedly exists it does not explain why a kidney which has for a long time successfully dealt with large quantities of ketone bodies suddenly fails and permits them to accumulate.

Other possibilities must therefore be considered. There are several.

1. The poisonous action exerted by the excess of sugar in the blood. The height of the blood-sugar in coma is indeed striking in some cases. Joslin³ has recorded a blood-sugar as high as 1.37 per cent. There are records of cases in coma with blood-sugars below 0.4 per cent., and diabetics not in coma are fairly often seen with a higher blood-sugar than this. However a blood-sugar above 0.4 per cent. is undoubtedly very common in coma. In seven of our cases the blood-sugar was estimated at the time of coma. The lowest value was 0.36 per cent., and all the other values were above 0.4 per cent.

2. Other toxins may be formed (suggested by Paddock, Rosenblom, McCaskey). There is, however, very little evidence of them.

3. The ketone bodies may poison the heart muscle and the circulatory failure may cause renal failure with oliguria and further accumulation of poisons. (This cause for oliguria was pointed out by Frederick Taylor in 1880.) That circulatory failure is characteristic of diabetic coma is shown by the feeble pulse and diminished intra-ocular tension that occur so commonly. However, in Case 8 the pulse appeared to one of us perfectly normal, and yet the blood-urea was 0.06 per cent., so that circulatory failure will not explain this matter completely.

4. The preceding polyuria noted in many cases, or the vomiting in others, may completely deplete the water reservoirs of the patient, the kidney thus becoming unable to excrete the poisonous ketone bodies owing to lack of the necessary water. The almost constant marked dehydration of a coma patient adds support to this, and the recovery, if only

temporary, which has frequently been noticed to follow the intravenous injection of large volumes of salines also points in the same direction. The diuretic effect of high blood-sugar¹⁹ would also account for the close association between a high blood-sugar and coma.

5. The ketone bodies may be produced so very rapidly that the kidney is unable to cope with them. This is probably what occurs in the cases of coma occurring within the first few weeks of the disease.

The last three factors probably account together or separately for the majority of cases of coma, and also for the different types of case (cf. Dreschfeld² and Frerichs,⁹ quoted by Warburg, and the report of the Insulin Committee.¹¹)

Prognosis.

All the cases of diabetic coma in this paper were young subjects. With efficient insulin treatment the most important immediate cause of death at the present day would appear to be renal failure, as indicated by prolonged oliguria, high blood-urea, and the excretion of mere traces of sugar or acetone bodies in the urine. Albuminuria is practically always present and so will not influence the prognosis. After recovery from coma there is no tendency to relapse into coma provided insulin treatment is continued. The ultimate severity of the case, as judged by the amount of insulin required, depends largely on the length of time the patient has had diabetes, if insulin has not been given previous to the coma, because the disease is naturally progressive in young subjects.

Our figures so far as they go support this view. The amount of recovery in Cases 1 and 5, where the history was short, is remarkable. Enocksson¹⁴ has recorded an even more striking success in a child who, within three months of recovery from coma, showed a perfectly normal tolerance to carbohydrates. This was unfortunately broken down by carbohydrate overfeeding, but on a suitable diet returned almost to normal again.

Diagnosis.

In view of the above results it is obvious that some cases of diabetic coma closely resemble uræmic coma. Take, for example, Case 8, where the urine showed no sugar or ketone bodies and where there was also urea retention. Such a case seen for the first time without a history would undoubtedly be diagnosed as uræmia, and only the estimation of the blood-sugar would indicate the correct diagnosis, and even here care in the interpretation of the result is required, since in chronic nephritis the blood-sugar tends to be slightly high. Further points in favour of uræmia in young subjects would be a blood pressure over 150 mm. and the presence of retinal changes, since diabetic retinitis (even if it exists, which is doubtful, and is not merely secondary to a coincident hyperplastic sclerosis, senile calcification or Monckeberg's sclerosis) is never, in our experience, met with in young subjects. As we are now able to combat diabetic coma by means of insulin with a good chance of success it is important that cases should not be missed, and in all cases of suspected uræmic coma where the history is doubtful blood-sugar estimations should be made.

Prevention of Diabetic Coma.

L. Blum has pointed out that patients who have been treated with insulin may pass rapidly into coma if insulin is suddenly stopped. The explanation is that owing to the insulin such patients have put on much weight in the form of fat. But fat is the chief source of ketone bodies, so that the latter are immediately formed in large quantity if the carbohydrate metabolism is suddenly interfered with by omitting insulin. As a contrast the case may be cited of a man, aged 54, seen by one of us in consultation with Dr. Bent before the insulin days. As the result of a four years' history of diabetes, he had been reduced to a mere skeleton. The urine gave a very faint Rothera reaction four days before his death, which was not from coma, but rather from inanition. The ketosis was presumably absent because the body fat had practically disappeared. The elderly patient

with diabetes is not in danger of diabetic coma, and such people are able to take a course of insulin treatment and obtain the full benefit from it, and they may then omit insulin when they like.

The risk that acute infection may precipitate coma has long been known. Out of ten of our cases where the notes are complete, a history of acute infection immediately preceding the coma was obtained in no less than seven, and this took the form of "sore-throat," "cold," "chill," or "temperature." It is thus obviously of great importance to protect patients with diabetes from acute catarrhal infections of the respiratory mucous membranes by means of face masks made of butter muslin, by Glegg's paraffin and vaseline treatment,¹⁵ by prophylactic vaccination, &c. If infection occurs the insulin must be continued, and if glycosuria and ketosis supervene the dose should be increased and extra carbohydrates should be given for the time being. The bowels should be kept open and plenty of fluid should be taken by the mouth.

The Treatment of Diabetic Coma.

Our general views on the treatment of diabetic coma have already been given by one of us,¹⁶ so that a brief summary is all that is necessary at present. Massive doses of insulin (20-40 units) are given every four hours, and at the beginning an intravenous injection of 10-20 units may be given if the case is urgent. The frequency of urea retention makes it important to give large volumes of fluid, so as to keep up the flow of urine. It is hardly ever necessary to give an intravenous injection of fluid because the latter can be absorbed rapidly and in larger quantity from the alimentary canal. If the patient cannot take one pint of fluid every hour by mouth, it should be passed directly into the stomach or duodenum through a nasal or Einhorn's tube, with the patient lying on the right side. The fluid should be isotonic, sugar, sodium bicarbonate, and a little salt being dissolved in tap water. A more accurate prescription is as follows: Dextrose 3 per cent., sodii bicarb. 0.5 per cent., potassium chloride 0.05 per cent., calcium chloride 0.03 per cent.

A look out must be kept on the bases of the lungs to see that oedema does not develop. The rapidity with which energetic treatment with insulin may cause diabetic coma to pass into hypoglycæmic coma without the patient recovering consciousness in between has been pointed out by Graham¹⁷ and by one of us,¹⁶ and is illustrated by Case 3 of the present paper. In the absence of blood-sugar examinations at frequent intervals, the plan of testing the urine at two-hourly intervals has been advocated, so that the administration of insulin may be temporarily stopped as soon as the urine is sugar free and only continued again when sugar returns. Such a plan would have failed in two of our cases, because the urine did not contain sugar even though the blood-sugar was high. It would be better to take account also of the ketone bodies of the urine by means of Rothera's and the FeCl₃ tests, because in hypoglycæmia both sugar and ketone bodies disappear from the urine; but even this plan would not have answered in our two fatal cases. Undoubtedly the safest plan is to continue giving sugar by mouth at frequent intervals until an abundant flow of urine is definitely established, and when this is the case sugar and ketone bodies will no longer be retained by the kidneys, and the urine will give a true index of the amount of hyperglycæmia and ketones in the body. The fluid intake may then be diminished and the sugar omitted, and the insulin should then be continued until the urine is sugar-free and free from ketones when tested at two-hourly intervals. Our subsequent treatment has been fully described elsewhere.¹⁶

Finally, we should like to thank the physicians at Guy's Hospital for facilities for examining their cases, and in particular we should like to thank Dr. J. H. Ryffel for permission to quote some of the analyses carried out by him. Part of the expenses of this investigation were defrayed out of a grant to one of us from the Medical Research Council.

Summary.

1. Eleven cases of diabetic coma have been reported and certain cases reviewed from current literature.
2. A definite renal element as shown by oliguria, albuminuria, and urea retention and failure to excrete ketone bodies, and occasionally sugar, is present.
3. In some cases this renal failure is so decided as to cause a marked resemblance to uræmic coma.
4. The cause of the renal failure has been discussed.
5. The treatment is carried out by means of large injections of insulin, and by the administration of much fluid, containing dextrose, by the mouth.

Note.—Since sending in this paper for publication, an interesting article by Dr. A. Clarke Begg has reopened the question (THE LANCET, July 11th, 1925, p. 69). In view of the present observations we would urge with Dr. C. G. Imrie (ibid., 251) that it is better not to divide up cases of diabetic coma into two distinct groups, since renal insufficiency in varying degree was present in practically all our nine consecutive cases. Further, we suggest that his cases, like our Case 8, were really acetonaemic, but that the kidneys fail to excrete the ketone bodies, and that the most rapid means of introducing fluid, which is urgently required by the body, is through the alimentary canal by nasal tube.

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THE TRANSMISSIBLE BACTERIAL LYSIN AND ITS ACTION ON DEAD BACTERIA.

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SINCE my first publication in THE LANCET in 1915 on the transmissible lysin to be found in association with micrococci and with bacteria of the dysentery-typhoid-coli group, a large number of papers have been published by different workers, and the literature on the subject at the present time is extensive. It is, however, not my purpose in this paper to do more than record a few additional experiments which I have carried out during the past six months.

No agreement has yet been reached as to the nature of the lytic agent, but, in the controversy that has centred round this important point, the absence of any definite action by this substance on dead bacteria has been used both in support of and against the view that it is an ultra-microscopic virus. It is therefore of interest to record that from my recent experiments it appears certain that dead bacteria, under special circumstances, are attacked and lysed.

A new strain of the lysable white micrococcus and fresh active lysin were obtained from vaccinia. The micrococcus was isolated free from lysin, and grown on agar slopes for 24 hours; from these a moderately turbid emulsion was made with normal saline. The emulsion was heated in a water-bath at 60° C. for one hour, then mixed with an equal quantity of ordinary sterile peptone-beef broth, and 2 c.cm. of the mixture pipetted into each of four sterile test-tubes.

Tube 1 received no addition.

Tube 2 was inoculated with a loopful of pure living micrococcus.

Tube 3 was inoculated with 2 drops of filtered lysin.

Tube 4 was inoculated with 2 drops of filtered lysin and a loopful of the living micrococcus.

The Standard Experiment.

This experiment throughout the paper will be referred to as the standard experiment. The four tubes were incubated at 37° C. After 24 hours tubes 1 and 3 showed no visible change. Tube 2 showed an increase of turbidity, while tube 4 showed a marked clearing of the emulsion. The experiment has been repeated a number of times with a similar result, although the time taken for tube 4 to clear may vary from one to three days according to the activity of the lysin used. It is worthy of note that a good result is also obtained if the coccus emulsion is prepared from cultures which are a week or more old, and with an emulsion heated at 75°–100° C., or when it is autoclaved at 120° C. for five minutes. Tube 1 in the experiment never seems to clear completely, but the opacity left is certainly in part due to the survival of some of the living bacteria, as can be proved by plating out the emulsion. The result is best shown when the dead coccus emulsion is not too thick, otherwise there will be insufficient fresh lytic agent produced to act on the maximum proportion of cocci in the emulsion. It is not essential to add broth to the saline emulsion of cocci, but without this the action is usually slower.

The experiments show clearly that there is lysis of dead bacteria when the lytic agent is being freshly produced in the presence of living bacteria of the same variety. In other words, that the lysin will act on both dead and living bacteria, but is only produced—or possibly activated—in the presence of the living. If the lytic agent is so activated or complemented by some thermolabile substance present in the living bacteria, it is a little surprising that the lysin, in the absence of living bacteria, does not act on the dead emulsion, seeing that the lytic agent in the experiments is mixed with broken-down products of living bacteria. It may, however, be that such a complementary agent, if present, is used up as fast as it is formed, and is therefore not free in sufficient quantity to produce any visible action. We know, from hæmolytic and many similar experiments, that such reactions are rarely simple in nature, and it seems probable from the experiments described here that the lytic agent consists of at least two portions, whatever the nature of these portions may be.

It may be recalled that d'Herelle in his work on the transmissible lysin—"bacteriophage"—claims to have separated a non-transmissible lysin from a transmissible virus, and if future experiments should prove the ultra-microscopic virus theory to be the correct one, then the experiments I have described might indicate that whereas the virus will grow only on the living bacteria, the lysin secreted by the virus will act on both the living and the dead, although the living may be first killed by the virus.

The Question of a Complementary Agent.

Some experiments were now carried out to test for the presence of a complementary agent that might be contained in living bacteria. The lysable micrococcus—free from the lytic agent—used in the standard experiment was grown in ordinary peptone-beef broth for three days at 37° C., and the culture then passed through a Doulton brown filter. The sterile filtrate was mixed with an equal quantity of fresh sterile broth, care being taken to avoid con-

taminations. This mixture was added to the emulsion of dead micrococci in place of ordinary broth which was used in the standard experiment, and the whole distributed into four test-tubes. Tube 1 was heated to 65° C. for an hour, and the tubes then inoculated as in the standard experiment—that is, tube 1 received no addition, tube 2 was inoculated with a loopful of living micrococcus, tube 3 received two drops of lysin, while tube 4 was inoculated with a loopful of coccus in addition to two drops of lysin. The experiment was repeated with slight variations. In some cases a much larger quantity of the filtered lysin was added, and in other instances, where an older broth culture was used, the filtrate of this was mixed with twice or three times its volume of fresh sterile broth before being mixed in equal quantity with the dead bacterial emulsion. In none of the experiments, however, was there any evidence of lysis in tube 3, the emulsion remaining as opalescent as in tube 1. Tube 4 in these experiments showed the same lysis of the emulsion as was observed in the standard experiment. It is clear from the absence of any lysis in tube 3, that the living micrococcus cannot be replaced by filtrates of the coccus growth. The experiments described, however, are not sufficient to prove that no complementary agent exists in the bacterial protoplasm, and it is intended to carry out further experiments to probe this question thoroughly.

In some other experiments a small quantity of fresh serum from a guinea-pig was added to the tubes which in other respects were set up in the manner of the standard experiment. This, however, did not activate the lysin in the absence of the living coccus. Tube 3 remained as opalescent as tube 1, while lysis took place only in tube 4.

Comparative Tests.

In carrying out these experiments comparative tests were usually made with emulsions of other bacteria which were killed at 60° C. and used in place of the lysable micrococcus. The bacteria included a slow-growing micrococcus also obtained from vaccinia, and giving a dense white heaped-up growth, the Shiga type of dysentery bacillus and *Bacillus phlei*. In each case four tubes were put up, and these were inoculated as in the standard experiment, and incubated as before. All the results were negative, there being no lysis of any of the emulsions, indicating that the lysin, in the presence of living cocci, is as specific in its action on dead bacteria as it is when they are living. This result is of particular interest in connexion with experiments that have been carried out by many workers who appear to have acclimatised a lysin for one bacterium to act upon another. If, however, the lytic agent is not of the nature of a virus, it would appear more likely in the acclimatisation experiments that a new variety of lysin, or possibly the specific portion of a double body, has been produced from the second bacterium, or the lytic agent may have always been present with the second bacterium, and been stimulated to start its cycle of activity. In any case it seems clear that the lysins associated with different bacteria cannot be identical, for while resistance of the bacterium may play a part in preventing any action in the case of the living bacterium, this cannot be so with emulsions heated as high as 120° C.

The Temperature at which Lysin is Destroyed.

In my original paper on the transmissible lysin, associated with the micrococcus to be obtained from vaccinia, it was stated that the lysin appeared to be destroyed at 60° C. Many workers have since given a higher temperature, while some have stated that there is not complete destruction at 65° C. In view of the different results obtained, I have recently carried out a large number of experiments to re-test this point. My original tests were carried out in the following manner: Agar streaks of the micrococcus showing well-marked lysis were taken and the growth washed off with 0.85 per cent. NaCl. This was made up to 200 c.cm. with a further quantity of saline and passed through a Doulton white filter. The filtrate

was then run into long capillary tubes, and these placed, completely immersed, in a water-bath regulated at the temperature to be tested. On repeating the experiment in this way I have found that the lysin is usually destroyed at 60° C. in one hour. If, on the other hand, the filtrate is placed in a sterile test-tube plugged with cotton-wool, there is nearly always a small amount of lysin left undestroyed. Such a method, however, cannot be relied upon to give accurate results. It has been found also that if the lysed cocci are mixed with the condensation water of the agar tube, and the concentrated lysin drawn into capillary tubes, and heated to 60° C. for an hour, the lysin is probably never destroyed completely. Various other circumstances, which for lack of space cannot be considered in this paper, appear to affect to a small extent the temperature at which the lysin is completely destroyed. It is also possible that the lysins associated with different bacteria are not all destroyed at exactly the same temperature.

There is one additional point of some interest that has been observed when carrying out these experiments. When a diluted lysin, which has been almost completely destroyed, is pipetted down a number of agar slopes which are then streaked down with the coccus and incubated at 37° C., the growth obtained is often a continuous white streak entirely free from clear areas. When subcultures are made from the primary growths on to fresh tubes of agar, these may also give a good white growth; but in the third or fourth subcultures, and sometimes in the second, a few clear areas may appear, and from these the active lysin can again be obtained. Moreover, the clear areas appear much more frequently in the third and fourth subcultures than in the case with similar areas arising "spontaneously" in a pure stock culture of the micrococcus. This seems to show that a growth of micrococcus, apparently free from lysin, may contain the lytic agent, although its action be masked or held in suspense. Most workers have considered this as one of the possible explanations of the lysed areas which occasionally appear to arise spontaneously in stock cultures supposed to be free from the lytic agent. It may be noted that d'Herelle has always put forward this suggestion when the spontaneous appearance of the lysin has been used as an argument against the virus theory. The experiments certainly indicate that it may in some instances be the correct explanation, although it is not necessarily the correct one in all cases.

Conclusion.

In my past papers I have discussed in considerable detail the possible nature of the ultra-microscopic viruses, and the possible relation of the transmissible lysin to these viruses. It will therefore be sufficient for me to observe in concluding this paper that there appears to be no definite proof that the transmissible lysin is a virus, although there are many arguments that may be used in support of this view. On the other hand, there are also many that may be used against it. It is probable that the question will remain unsettled until we know for certain the nature of these viruses. The experiments described in this paper appear to offer scope for further investigations along similar lines, and these in the future may throw some additional light on the problem.

HOSPITAL AIDS.—During the past year nearly £3000 was distributed to London hospitals and other philanthropic institutions by the Lion Hospital Aid Society. This little known organisation was formed in 1898 by the employees of Messrs. Lion, Lion, and Son, an East End firm of boot manufacturers. Its income in the first year was £70; it now exceeds £6000. The money is raised by collecting boxes, entertainments, and social gatherings.—The object of the Samaritan Fund of St. Bartholomew's Hospital, which has just reported upon its last year's work, is to assist patients after their discharge. The fund, which was formed in 1833, through the benevolence of Mr. Alexander Bennett, has aided 74,000 patients at a cost of £56,000, of which a little more than £1000 was spent last year. The help takes the form of money grants, railway fares, instruments, appliances, and convalescent treatment.

CANCER AND ACQUIRED RESISTANCE TO TUBERCLE.

By THOMAS CHERRY, M.D., M.S.,
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A SUGGESTIVE feature in recent reports on public health from many parts of the world is the steady decline in the number of deaths from tubercle and the equally steady advance of cancer. In the first English records, more than 80 years ago, this reciprocal movement was already apparent, but at that time cancer was quite unimportant as compared with phthisis. By 1855 the phthisis-rate had fallen to 2600 per million, and the cancer-rate had advanced to 320. The two rates are now about equal in England and Wales. The changes which have taken place in the past 30 years and the percentage reduction and increase in the respective rates in each five-year period are as shown in Table I.¹

TABLE I.—Mortality Rates Per Million Living.

Periods.	Phthisis.	Percentage reduction.	Cancer.	Percentage increase.
1871-5	2217	—	445	—
1876-80	2038	8.2	494	11.0
1881-5	1830	10.1	548	11.0
1886-90	1635	10.6	632	15.3
1891-5	1461	10.6	712	12.6
1896-1900 ..	1323	9.4	800	12.3
1901-5	1218	8.0	867	8.4
1906-10	1106	8.4	939	8.3

The fact that the one disease appears to a large extent to be taking the place of the other may be a chance coincidence, and these figures cannot be applied to the problem without further analysis. Not only do the two diseases affect different periods of life, but in England the history of the rise of cancer and the decline of phthisis is different in the two sexes. While it is possible that occupation may have as great influence in the one case as in the other, this is at the present time little more than a surmise.

Perhaps the most important material bearing upon this question is the Supplementary Reports of the Registrar-General for the years 1891, 1901, and 1911. These contain an analysis of the deaths of all males over the age of 15 which were registered in the three consecutive years of each census period. Each report contains about half a million deaths classified by occupation, age, and causes of death. Table V. (Report, 1911, p. xxii.) gives the "Comparative Mortality Figures," or, in other words, the relative expectation of life, for most occupations. After deducting deaths by accident I selected occupations with approximately 200,000 deaths, half those with the best and half with the worst expectation of life. These may be arranged as under:—

	"Best" lives.	"Worst" lives.
Total deaths over 15 years ..	98,413	100,011
Total deaths from cancer ..	9,745 (9.90%)	9,366 (9.35%)
Cancer under 65 years ..	5,011	5,897
Deaths at 65 and over ..	52,366	35,323
Cancer at 65 and over ..	4,734 (9.23%)	3,469 (9.86%)

When the cancer-rate is expressed as a percentage on the total number of deaths in each case it falls somewhat more heavily on the "best" lives. But cancer attains its greatest frequency about the age of 65, and a much larger proportion of the "best" lives reaches that age. If we express the rate for the age-period 65 as the percentage on all the deaths after 65 the rate is lower for the "worst" lives. Throughout this investigation the cancer-rate is calculated for any given age-period as a percentage on all the deaths from the beginning of that age-period to the end of life. In this way results are obtained as shown in Table II.

The large number of deaths from cancer in men following occupations corresponding to those represented by these "best" lives has probably created an

¹ Table VI., Statistical Review, 1921, p. 35.

TABLE II.—Age-Incidence of Cancer on 200,000 Deaths (1911).

Age-periods	25-	35-	45-	55-	65- to end.
" Best " lives ..	0.18	0.60	1.8	3.9	9.0
" Worst " lives ..	0.21	0.81	2.7	5.2	9.8

impression that cancer selects those in easy circumstances and passes by the poorer and the working-classes. But Table II., comprising nearly half the deaths of men in England during three years, proves that this is not the case. Cancer selects the survivors of the occupations which have involved a hard struggle for existence. The worst lives are more heavily hit at every age-period.

In order to test whether these results applied generally, I turned to Social Class 1 of this report (p. 3). This is described as " Upper and Middle Classes," and comprises, after deducting accidents, 45,557 deaths over the age of 25. Of these 45.3 per cent. were over the age of 65. Corresponding figures from the coal-miners are 20,992 deaths, of which 38.8 per cent. were over the age of 65. The expectation of life was therefore much better in Social Class 1, but on analysing the two groups of deaths (Table III.) the results are quite the opposite from those of Table I.

TABLE III.—Cancer-Incidence by Age: Coal-Miners and Social Class 1 (1911).

Age-periods	25-	35-	45-	55-	65- to end.
Coal-miners	0.26	0.92	2.6	4.4	6.6
Social Class 1.. ..	0.23	0.75	2.6	5.0	11.1

Thus in the last two age-periods, which are all-important in regard to cancer, the coal-miners were much better off than the upper and middle classes, whereas from Table I. we should have expected the opposite to be the case. Amongst the differences in the causes of death in these two classes of men is the fact that Social Class 1 has about 15 per cent. more deaths from phthisis than the miners at all ages, and that when the two age-periods 25-35 and 35-45 are taken as the basis of comparison this excess amounts to more than 25 per cent. I found that the percentage of phthisis on these two age-periods formed the best available index for the incidence of this disease at all age-periods, and on this basis 58,000 deaths were compiled from occupations in which the index was less than 3.10 and more than 8.50 respectively. Deaths by accident, all deaths under 25, and occupations in which the total deaths were less than 1000 were omitted from the lists (Table IV.).

TABLE IV.—Age-Incidence of Cancer in Relation to Phthisis (1911).

Age-periods	25-	35-	45-	55-	65- to end.
58,866 lowest phthisis	0.11	0.42	1.38	3.47	9.23
56,716 highest phthisis	0.30	1.00	3.25	5.60	9.86

It will be seen that in all the age-periods except the last the incidence in the low phthisis group is only about half of that in the high phthisis group. But in contrast to this striking co-relation of the two diseases we find that amongst the occupations included in both lists there were some, such as solicitors and barristers, which had a low phthisis and high cancer-rate, and conversely tool-makers and others which had high phthisis-rates associated with low cancer. On attempting to chart the occupations on the basis of cancer and phthisis for 1891 the results were not satisfactory.

It then struck me that we were comparing unlike things, that resistance to tubercle is probably established or lost fairly early in adult life, and therefore the proper method was to compare the incidence of cancer with the incidence of tubercle in the same

occupation 25 or 30 years earlier. Unfortunately the details in the earlier census reports do not include the ages as well as the causes of death, and that for 1891 is the earliest available material.

From the report for 1891 I arranged according to their phthisis index the occupation that could be traced forward to 1911. This index was taken from the two age-periods 25-35 and 35-45. The cancer index is the sum of the four cancer percentages from 25-35 to 55-65. As before, occupations with less than 1000 deaths, deaths under 25, and accidents were omitted. The number of deaths available for analysis is about 320,000. The drift of the two diseases may be seen from the following groups of occupations (Table V.).

TABLE V.—Groups of Occupations.

Group.	Number of deaths.	Phthisis, 1891.	Index, 1911.	Cancer, 1891.	Index, 1911.
A	45,712	3.87	2.37	3.66	5.01
B	52,835	6.47	4.59	4.82	7.17
C	66,676	9.83	7.01	4.51	8.12
D	74,736	12.68	7.92	6.18	9.92
E	26,018	19.20	12.13	6.76	12.95
Total ..	265,977				

These groups comprise the following occupations:—

Group A.—1. Farmers. 2. Clergy. 3. Farm workmen. 4. Wheelwrights. 5. Coal merchants and retailers. 6. Sawyers. Group B.—7. Brickmakers. 8. Gardeners. 9. Coal-miners. 10. Railway platelayers. 11. Fishermen. 12. Blacksmiths. 13. Greengrocers. 14. Inn-keepers. 15. Bargemen.

Group C.—16. Labourers (other than farm labourers).

Group D.—17. Railway officers and clerks. 18. Railway drivers and stokers. 19. Railway porters, guards, and signalmen. 20. Coach and bus drivers and grooms. 21. Draymen and carters. 22. Watchmen and messengers. 23. Engineers and boilermakers. 24. Iron manufacturers. 25. Painters and plumbers. 26. Printers. 27. Dyers. 28. Butchers. 29. Gas workers.

Group E.—30. Hotel employees. 31. Musicians and theatre employees. 32. Commercial travellers. 33. Commercial clerks. 34. Wharf labourers. 35. Coal-heavers. 36. Brass workers. 37. Paperhangers. 38. Brewers.

The incidence of cancer by age-periods in these groups is set out in Table VI. For convenience of comparison the results for 1911 are printed in italic type.

TABLE VI.—Age-Incidence of Cancer, 1891 and 1911.

Age-periods ..	25-	35-	45-	55-	65 to end.
Group A { 1891	0.09	0.37	0.90	2.3	4.9
{ 1911	0.11	0.40	1.21	3.29	8.99
Group B { 1891	0.13	0.48	1.37	2.84	4.77
{ 1911	0.19	0.69	2.13	4.16	8.32
Group C { 1891	0.14	0.44	1.42	2.51	4.21
{ 1911	0.17	0.71	2.36	4.88	8.35
Group D { 1891	0.20	0.69	1.88	3.41	4.86
{ 1911	0.27	0.89	3.00	5.76	10.00
Group E { 1891	0.23	0.66	2.02	3.8	5.4
{ 1911	0.29	1.10	3.9	7.3	11.2

Relationship of Decline and Increase Between Cancer and Phthisis.

From this analysis of more than 82 per cent. of the deaths available for this investigation the following results appear:—

1. When the groups are arranged on the basis of the phthisis percentage in 1891 the incidence of cancer in 1911 formed nearly a complete sequence for every age-period.

2. With few exceptions the occupations with both high phthisis and high cancer in 1891 increased at a much faster rate between these dates than those with the lowest phthisis and cancer-rates in 1891.

3. The incidence of cancer at all age-periods in 1911 was always light or heavy in accordance with the phthisis incidence on the same group.

4. During these 20 years there was no instance of an occupation which showed reduction in phthisis without showing increase in cancer.

This series of co-relations may be due to chance, for as the one disease is declining and the other increasing it is possible, though not very probable, that every occupation should be normal in both respects. If there is a causal relationship the cause must come out of phthisis and act upon cancer, for the one occurs early and the other late in life. The probability of cause and effect grows with each successive step, as we establish the following propositions:—

(a) A similar relationship of decline and increase cannot be demonstrated between cancer and any other disease or group of diseases.

(b) The co-relation of phthisis and cancer is found not only in the groups but in each of the 38 occupations which constitute the groups. Most of the occupations with less than 1000 deaths also fall in line. The few exceptions to this rule will be noticed subsequently.

(c) There is a recognisable element of proportion in the co-relation.

In a broad way we can say "a large increase in cancer means a large reduction in phthisis; little phthisis in 1891 and little cancer in 1911." I have not yet been able to define this element of proportion, but the following examples are sufficient to arrest attention. The course of the two diseases can be compared in a number of allied occupations. In such a group many variable factors are greatly simplified, such as the type of man, the question of inherited tendencies, the conditions of life and food-supply, and of wages. Such factors are more involved when we compare coal-miners with another social class than when we compare miners in Lancashire with those in Yorkshire (Table VII.).

TABLE VII.—*Phthisis and Cancer in Allied Occupations.*

		Phthisis index, 1891.	Cancer index, 1911.
Textile manufactures	Silk	37	41
	Hosiery	77	62
	Wool	88	71
	Cotton	113	73
	Dyers	110	98
Iron trades	Blacksmiths	72	74
	Ship-builders	88	77
	Iron manufactures	96	91
	Wagon works	99	95
	Brass works	176	115
Building trades	Sawyer	46	66
	Carpenters	90	78
	Bricklayers	110	98
	Plasterers and paperhangers	113	119
	Slater, tiler	135	134
		Phthisis index, 1891.	Cancer index, 1911, all ages.
Coal-miners	Staffordshire	44	133
	Lancashire	65	135
	Wales	69	142
	Durham, Northumberland	72	150
	Derby and Notts	74	153
	Yorkshire	85	158

(d) The same element of proportion is seen if a graph be prepared in which cancer in 1911 is plotted against phthisis in 1891. 95 per cent. of all the deaths are included in the occupations which fall within the area bounded by the lines which diverge at an angle of 12 degrees. It is possible that this angle would be less if the phthisis index could be built up from percentages of age-periods earlier than 25-35. The probability of chance becomes less as the angle becomes less. When the same occupations are plotted against phthisis in 1911 the angle is 25 degrees.

(e) By means of the percentage of cancer on the three youngest age-periods it is possible to foretell what the incidence will be in later life. The same factor decides the incidence in all the age-periods from 25 onwards. This rule is, I think, invariable and if established it almost precludes the possibility of chance. Take, for instance, the actual number of deaths from cancer in two occupations about equal in size in 1911—gardeners and clerks (commercial, law, bank, and insurance) (Table VIII.).

(f) A time element is found in the co-ordination of phthisis and cancer. An inspection of the graph shows that in 1891 all the occupations were nearer to the cancer base line than in 1911. If we could make a similar graph for earlier periods the dots would be still nearer this base line. In 1861 the cancer-rate in men was 220, as against 900 in 1911, and hence the factor which has determined the present rate of increase has apparently been in operation for about 65 years.

TABLE VIII.—*Deaths from Cancer in Gardeners and Clerks in 1911.*

Age-period.	Gardeners.		Clerks.	
	Quota.	Deaths.	Quota.	Deaths.
25-	9975	9	10,455	44
35-	9541	45	8830	102
45-	8951	162	7184	271
55-	7993	324	5265	353
65 to end.	6236	639	3155	363

(g) In men an increase in the cancer-rate of 17½ per cent. occurred in the five-year period 1881-6. This period was also marked by the first decided reduction in the phthisis-rates for men between the ages of 45 and 65.

When the three census periods are compared it is found that the reduction of phthisis and the increase of cancer has taken place by two methods. Some occupations have changed in both respects at a nearly uniform rate, so that in a graph the three points are joined by a straight line. In others a great reduction in tubercle in the first ten years is followed by a sharp rise in cancer in the second, so that the position for 1901 is the point of an obtuse angle. It is noteworthy that in very few cases is this a right angle, and in only two cases has there been an increase of phthisis between 1901 and 1911, so that the angle becomes less than a right angle. In no case whatever did a reduction in phthisis take place between 1891 and 1901 without an increase in cancer.

In the following group I presume that the reduction in phthisis has been a process which has occupied a longer time than usual. A great reduction in tubercle and a considerable increase in cancer had taken place by 1911, but I anticipate that the sharp rise in cancer will be disclosed by the census of 1921.

Group F.—(34,707 deaths.)

Index 1891: Phthisis, 1274; Cancer, 490
" 1911 " 780 " 775

Watchmakers and jewellers, toolmakers and cutlers, cabinet makers, cotton weavers, general storekeepers, booksellers, potters, bakers, teachers, tailors, drapers, private servants.

A small number of occupations, including about 12,000 deaths, have been rejected for a variety of reasons. Of these, the most important is the change of occupation which often occurs in a man's life-time.

In this investigation the deaths in each occupation have been treated as a self-contained unit of the population, which died out completely in the three years of the census period. No attempt has been made to connect them with the living members of the same occupations who filled in census papers. This method has given a high degree of uniformity to the results set out in this paper. For the last age-period, 65, the deaths from any given disease are expressed as a percentage of all the deaths after 65. For the next preceding age-period a quota is found by adding together all the deaths of the last two age-periods. The percentages are thus calculated on all the deaths which occurred after 55, and so on for the earlier age-periods. As an example, we may say from Table VI. that 4.88 per cent. of labourers over the age of 55 died of cancer before they reached the age of 65. The drawback of this method is the fact that in any year in which the mortality was excessive, as, for example, from influenza, all the percentages from cancer are too low, because the total number of deaths is excessive and the deaths from cancer are not perceptibly affected by influenza. On the other hand, the deaths from phthisis are greatly increased by influenza, and this percentage is higher than normal. This objection does not, however, apply to the comparison of occupations with one another at each census period, because they all have been in the same relation to any such disturbing factor. The Registrar-General's reports include deaths from 15 and upwards in each occupation, but the proportion of deaths in the age-period 15-25 is so variable to the total deaths in many of the occupations that I decided to begin with the age of 25. This compelled me to base the index for phthisis on age-periods which are probably too far advanced for the

best results, because there are many indications that the age-period 10-25 is all important in regard to this disease.

I have given the data for phthisis throughout this paper, because other forms of tubercle are not set out in reports earlier than that for 1911; but in any case phthisis covers about four-fifths of the deaths and it is also the most important source of infection, so that it is possible that cancer rises and falls in relation to phthisis rather than to tubercle in general.

Significance of Cancer After the Age of 65.

With regard to the significance of cancer after the age of 65 the following points must be weighed. If these deaths are included in an estimate of cancer incidence during the whole life-time they tend to equalise the rate for all occupations. For the occupations with the greatest proportion of deaths after 65 are those which have the lowest incidence of cancer at all the other age-periods. Conversely, the occupations with the lowest proportion of deaths after 65 are those with the highest cancer-rates at all age-periods. The large numbers at the lower rate in the "best" lives more than balance the small numbers at the higher rate in the "worst" lives. In 1911 the cancer-rate for 65+ was about 10 per cent. in most occupations. There is no difficulty in the theory that more than 1 out of every 10 had become resistant to tubercle, even in such occupations as farm labourers. These considerations led me to close the index for cancer at the age of 65.

The foregoing results appear to be conclusive against the theory that cancer is simply one of the degenerations of old age, and that the present increase is due to the higher percentage of people that now reach old age. By the methods I have adopted it is easy to calculate the percentage that reached 65 in relation to the number that entered any given occupation at 25. If the occupations are grouped on this basis it is found that, in most cases, the higher the percentage that reaches 65 the lower is the cancer incidence at all age-periods. Thus, in 1911, 66.8 per cent. of the deaths in Group A were over the age of 65, while this percentage in Group E was 25.4. But the cancer-rate for Group E was higher than that for Group A at every age-period, whereas if cancer depended chiefly on old age the opposite should be the case. Again, if old age was the dominant factor we should expect the cancer-rate to increase steadily up to the end of life, as is seen in the deaths from cerebral hæmorrhage, but this is not the case. (Table IX.)

TABLE IX.—Percentage of Cancer and Apoplexy in Men.

Age-periods	.. .. .	55-	65-	75 to end.
Cancer	{ 1911	4.7	6.7	6.1
	{ 1921	6.0	8.5	7.9
Cerebral hæmorrhage	{ 1911	2.4	5.2	8.0
	{ 1921	2.2	5.3	9.5

There is perhaps an analogy between the two diseases in this respect. Apoplexy in early life may usually be explained by the presence of a predisposing factor which either raises blood pressure or weakens the wall of the vessel. Apoplexy late in life seems to have been common from the earliest times. Cancer at all ages over 35 has increased so much during the past 40 years that the disease has become a new problem in all civilised countries. This fact alone makes it probable that the old causes which produced a small number of cases in the past are now at work on a type of population that has been specially prepared for the disease.

Early Prevalence of Tubercle.

The history of tubercle in England shows that it was very prevalent during the early part of last century. In some localities hardly a family could be found which was not affected with the "strumous disposition." After allowing for some exaggeration in such generalisations there can be little doubt that the

high figures of all the early annual reports are fully justified. With the marked improvement in food-supply and the slower amelioration of the other conditions recovery from a definite attack of phthisis would become more common. In some cases a high degree of immunity might be developed without the occurrence of a recognised attack of phthisis. Let us suppose that frequent contact with tubercle bacilli develops powers of resistance in the individual perhaps on lines similar to what is known to be the case in diphtheria and other diseases. If this resistance includes a quickening of the readiness to proliferation of cells in response to a special form of stimulus most of the facts discussed in this paper at once fall into line. The proliferation is seen in the typical epithelioid cells of the miliary tubercle. The development of powers of resistance to tubercle in people who did not succumb to that disease might thus form a predisposing cause of cancer in later life. The greater the percentage of phthisis in any occupation the greater the chance of any given individual either dying of the disease or else developing powers of resistance to it.

If phthisis acts as a predisposing cause of cancer I think it will be possible to a great extent to explain the difference in the history and incidence of cancer in women as compared with men. There are differences in the cancer-rates in different countries which may also be cleared up.

Further light on the relationship of cancer and tubercle may be obtained by reports on the family history of cancer patients. About 15 years ago Williams, of the Cancer Hospital, London, expressed the view that when several members of a family had died of phthisis the survivors were very apt to develop cancer. So far as I know no material exists at present for following up this line of inquiry. Post-mortem reports on cases of cancer should include a careful search for the signs of obsolete tubercle. Here, again, there are a few casual references to the association of the two conditions, but these do not cover a sufficient number of cases to be of much value. The facts I have brought forward may suggest lines along which a clinical test for early cancer may be worked out.

Finally, it should be possible to determine by experiment whether heightened resistance to tubercle has any effect upon the fate of transplanted cancer cells and upon the readiness with which irritation cancers can be produced. Under any circumstances cancer work is a slow and expensive process, but here is at least one definite problem the solution of which should be attempted without delay. The results of this statistical inquiry can be affirmed or refuted by experiment.

Clinical and Laboratory Notes.

BAKERS' DERMATITIS.

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THE intractable and relapsing skin eruptions commonly associated with the baking and confectionery trades have recently attracted considerable notice in both the medical and lay press, and, according to the report of the recent Conference of Operative Bakers and Confectioners published in the *Times* of August 19th last, the general secretary of their Union stated that there were 20 cases of bakers' dermatitis to-day where only one existed a few years ago. This may be true of some factories in Scotland and the north of England, but not, I think, of those in London.

In view, however, of this widespread interest in an industrial problem of much importance to employers and to their workpeople, it is possible that I may be assisting others, also engaged in seeking its solution, by making known the results so far attained in the course of investigations conducted during the past

nine months in an up-to-date food factory. The investigations are incomplete, and doubtless some of the conclusions reached may have to be modified in the light of further experience and study.

These conclusions may be briefly summarised as follows:—

1. In spite of the opinions expressed at the meeting of the Section of Dermatology of the Royal Society of Medicine in October, 1924, it appears that there is a definite dermatitis to which persons engaged in factories manufacturing bread and pastry are peculiarly susceptible. It does not seem to be confined, however, to persons actually handling flour, dough, or sugar, but may, and does, affect workers in other departments of the same factory, thus suggesting that the causative agent may be carried in the dust of such factories. Certain mycelial fungus growths have, indeed, been cultured from this dust, but so far no definite connexion can be traced between these growths and those found in the skin lesions.

2. The skin lesion is primarily a vesicular eruption, similar in appearance to the sudamina or miliaria associated with obstruction of the sweat ducts, and is accompanied by intense itching, especially when the part is warm. That this irritation is due to distension of the vesicles is proved by the fact that it is immediately relieved by puncturing them. In the early stage the eruption is confined to the palmar aspect and inter-digital folds of one or both hands, the primary focus always being in the skin area most exposed to irritation or abrasion in the particular occupational process in which the patient is engaged. This primary vesicular lesion is rapidly followed by secondary lesions, the earliest of which are multiple fissures in the inter-digital spaces and on the dorsal aspects of the fingers. It quickly spreads at the periphery and, if not arrested at this stage, staphylococcal infection supervenes, and the condition then presents the clinical picture of eczema vesiculosum.

3. The primary vesicles contain a clear straw-coloured fluid. Microscopical examination of this fluid when obtained by aseptic puncture of the vesicles reveals the presence of numerous yeast-like mycelial growths.

4. The disease spreads by inoculation of abrasions in the surrounding area with the fluid from the original vesicles, these abrasions being caused, simultaneously with the rupture of the vesicles, by the scratching which the intense irritation incites.

5. The disease is communicable from one person to another by inoculation, which seems to take place through minute abrasions of the epidermis such as are common among manual workers. This is demonstrated by the fact that a small abrasion in the palm of my own hand, caused by a piece of stalk when rubbing up plug tobacco, became infected when collecting the fluid from a patient's vesicles, the same mycelial fungi being found in the vesicles which subsequently developed, although I had never handled flour or dough. I have kept this lesion "alive," though under control and confined to an area covered by a sixpenny piece, for eight months.

Prophylaxis.

As regards prophylaxis, my experience in a factory employing over 5000 persons, more than two-thirds of whom are directly engaged on food-producing processes, seems to indicate that the incidence of the disease can be effectually controlled by comparatively simple preventive measures. Those I have adopted—so far with conspicuous success, as in spite of the very large number employed only three persons are at present under treatment for this disease—are the following:—

(a) The exclusion as far as possible from dough and pastry handling of all persons with dry skins which render them liable to develop chaps and cracks in winter.

(b) Insisting that all minor skin lesions such as cracks, abrasions, and "hang-nails" are reported at once and treated with a solution of nitrate of silver or iodine.

(c) Weekly manicure on special lines, including the addition of "anosol" to the soap solution used for softening the finger-nails, for workers particularly liable to contract the disease.

(d) Providing all workers in contact with flour, dough, pastry, and sugar with a small towel suspended from a tape round the waist, these towels being collected and washed daily. The abolition of all "roller" or "common" towels.

(e) Supplying bowls of a weak, harmless antiseptic solution, such as sodium hypochlorite, in suitable positions in work-rooms, and encouraging employees to rinse their hands in this solution occasionally while at work.

(f) Every skin eruption, however trivial it may appear, has to be reported to the medical officer immediately, and any cases detected are suspended from duty and treated at the factory surgery until well.

Treatment.

After trying various methods of treatment I have found Metchnikoff's ointment (subchloride of mercury 33 per cent. in anhydrous lanolin) entirely satisfactory if applied freely, rubbed in, and covered to exclude air. When possible the evacuation of the vesicles greatly hastens healing. All cracks are painted with nitrate of silver, 15 gr. to the ounce of spiritus ætheris nit., before the ointment is applied. A case so treated in the early stage generally clears up entirely in a week, but, after resuming their ordinary work the patients continue to apply the ointment at night, when off duty, for a month or so in order to prevent relapses. Sometimes considerable patience is required to eradicate the disease, but the intelligent worker will at once report the appearance of a fresh vesicle which can then be evacuated antiseptically and aborted without further absence from duty.

I wish to acknowledge my indebtedness to Dr. Henry Semon and to Dr. Dennis Embleton for their help in the early microscopical investigations which have been carried out, partly by the latter and also in the fully-equipped biological laboratories at the firm's headquarters by Dr. L. H. Lampitt, F.I.C.

INTRADURAL ABSCESS SECONDARY TO FRONTAL AND ETHMOIDAL SINUSITIS.

By H. ALEXANDER COWAN, M.R.C.S. ENG.,
REGISTRAR, ROYAL EAR HOSPITAL (EAR AND THROAT
DEPARTMENT, UNIVERSITY COLLEGE HOSPITAL).

THE following case presents a number of points of interest. There was long-continued nasal obstruction and nasal discharge for over 20 years, which were relieved by opening up the ethmoidal cells and removing the polypi. Rapid recovery followed, and the patient was quite well afterwards for six weeks. There was then a sudden development of signs of increased intracranial tension, all within 24 hours after the patient was readmitted to hospital. These signs pointed to abscess of the frontal lobe, and a frontal abscess was diagnosed, but post mortem no pus was found in the brain substance.

Clinical History.

A pale, thin man, aged 41, came to the out-patient department of University College Hospital on Jan. 8th, 1925, complaining of nasal discharge, nasal obstruction, and frontal headache. He said that he had suffered from nasal polypi for 20 years, and had them removed on several occasions. On examination his nose was full of polypi on both sides; transillumination showed both antra dark. He was admitted to hospital on Feb. 1st and operated on next day by Mr. J. F. O'Malley.

A large number of nasal polypi were removed from both sides of the nose, the ethmoidal cells being already opened up. The naso-frontal ducts were curetted with rasps to provide adequate drainage. Both antra were punctured and washed out, but neither contained pus.

The patient went home apparently quite well on Feb. 7th. He attended the out-patient department weekly and seemed much improved, and was progressing well. On March 26th, after a week of intensely cold weather, he came again to the out-patient department and complained of having suffered very badly from headaches for the past few days. He had a profuse nasal discharge, worse on the left side, his temperature being 101.4° F.

He was readmitted to hospital on March 27th and treated with inhalations and weak iodine irrigations. On April 1st he was extremely restless and made several attempts to get out of bed; he also appeared to have difficulty in speaking. At 1 P.M. he was completely aphasic and could not understand anything said to him. Later in the afternoon slight

hemiparesis developed on the right side. At 6 P.M. he was seen by Dr. F. M. R. Walshe; he then had slight but definite right hemiparesis, face, arm, and leg being affected, and some ptosis and external strabismus of the left eye. He appeared unable to express himself in answer to questions and showed a considerable defect in comprehension of spoken speech. He was somewhat stuporose and inclined to be restless. An abscess of the left frontal lobe was diagnosed.

Operation.

An external frontal sinus operation was performed on the same evening by Mr. O'Malley; the sinus was found to be full of pus, but no track into the skull could be found. The lining membrane was very much thickened and the naso-frontal duct partially blocked, which was then opened freely into the nose. The frontal bone was then opened just above the superciliary ridge, and as soon as the dura was exposed it was seen to bulge. On incising the dura over an ounce of thick yellow pus poured out, which seemed to come from the frontal lobe, as this presented in the wound. Drainage was established with two rubber tubes placed side by side. A tube was also put through the frontal sinus and carried into the nose. Throughout the night the patient's condition became worse and he died the next morning.

Post-mortem Examination.—The following was the condition found. There was pus in both frontal sinuses, a large intradural abscess was on the left side, producing pressure on the left frontal cerebral cortex; there was also a collection of pus at the base of the brain. No cerebral abscess was found, but there was pus in the left lateral ventricle.

I must thank Mr. O'Malley for permission to publish these notes.

Reviews and Notices of Books.

INTERNAL SECRETIONS.

The Chemical and Physiological Properties of the Internal Secretions. By E. C. DODDS, Ph.D., D.Sc., M.B., B.S., Professor of Biochemistry in the University of London; and F. DICKENS, M.A., Ph.D., Assistant in Biochemistry. London: Humphrey Milford, Oxford University Press. 1925. Pp. 214. 8s. 6d.

THE object of this small volume is to present a summary of the literature dealing with the chemical aspects of the internal secretions. This includes the methods for preparing active extracts, the isolation and purification of the active principles, a discussion of their chemical constitution, and of the various methods used for standardising the products. Up to now information covering these various points was scattered very widely throughout scientific memoirs and had to be sought for sometimes even in the files of the Patent Office. The work has been done with great care and a highly technical subject is presented in such a clear and interesting manner that it can be followed without difficulty even by those who are possessed of only an elementary knowledge of biochemistry. A bibliography is appended to every chapter and all the references given have been consulted personally by the authors.

The book begins with the internal secretion of the pancreas—insulin—and the insulin-like substances obtained from other sources. This is followed by the various active substances obtained from the anterior and posterior lobes of the pituitary—tethelin, pituitrin, histamine. The next chapter deals with the various active preparations obtained from the thyroid. A brief but very interesting chapter is devoted to the ovarian hormone. Here the authors state that they have succeeded in confirming the observations of Hermann and Frinkel and of Allen and Doisy, who obtained active preparations capable of inducing œstrus. A chapter is devoted to adrenalin, and the final chapter deals with secretin, the parathyroid glands, and spermine.

The title of the book is somewhat misleading in giving the impression that the physiological properties of the internal secretions have received the same careful and exhaustive treatment as the chemical properties. If this had really been accomplished the

book would have had to be greatly expanded. As it is the authors have dealt in considerable detail mainly with those problems in which they are especially interested. Thus the action of insulin is subjected to a clear and detailed discussion, and the conclusion is arrived at that no adequate explanation has as yet been offered. Pituitrin is also treated fairly fully. But the sections dealing with adrenalin and the thyroid hormone are short and far less complete. The former begins with the statement that the most important property of adrenalin is its pressor effect; the latter opens with the remark that the most important action of thyroid tissue is its ability to restore cretins and myxedematous patients to normal. If we mean by physiological properties the part played by hormones in the normal organism then the properties quoted would appear to be among the least important. The statement that adrenalin produces no effect upon the pupil unless the superior cervical ganglion is excised applies only to local application, and we should have thought that the effect of toxic doses of adrenalin was not indefinite as stated, but clearly to be seen in intense pulmonary congestion and hæmorrhage. The action of adrenalin on metabolism is discussed in a few lines and summed up in the remark that "little general effect can be found except the glycaemic reaction." But this reaction requires very massive doses of adrenalin, exceeding probably the amounts secreted under physiological conditions, and no reference is made to the extensive literature based on the work of Cramer, Boothby and Sandiford, Aub and his collaborators, and more recently of Cannon, which shows a general agreement to the effect that adrenalin increases the metabolism, raises the heat production, and is secreted as a physiological response to cold, contributing to the heat regulation of the body.

In the section dealing with secretin no mention is made of the evidence presented by Prof. Dodds himself some years ago to the effect that the formation of secretin by acid may only be an unimportant factor in pancreatic secretion. In the section on the parathyroids reference might have been made to the work of Dragsted and of Luckhard on the intimate relation of diet and the function of the parathyroid glands as well as to the recent striking therapeutic results obtained by Scott in sprue, since they have a bearing on the function of these glands in relation to calcium metabolism. These little shortcomings, as we have felt bound to regard them, do not, however, affect the main object of the book, and can be readily rectified on revision.

As a readable and reliable work of reference on the chemistry and biochemistry of the internal secretions the book is strongly to be recommended. Literally, to repeat the cliché, it fills a long-felt want.

DENTAL STUDY AND PRACTICE.

The Anatomy of the Root Canals of the Teeth of the Permanent Dentition. By WALTER HESS, M.D., D.D.S., Professor of Operative Dentistry in the University of Zurich. *The Anatomy of the Root Canals of the Deciduous Dentition and the First Permanent Molars.* By Dr. Med. Dent. ERNST ZÜRCHER, School Dentist of Zurich. London: John Bale, Sons and Danielsson. 1925. Pp. 199. 16s.

THE conception of the root canal of a tooth as a funnel-shaped space of simple form, extending down the root of the tooth, is still tacitly assumed to be correct by many dentists. Were this so the problem of filling the root canal of a pulpless tooth would be comparatively simple. The examination of teeth by histological and other methods, dating as far back as 1844, has shown that this conception is inaccurate. But until a technique could be elaborated which would demonstrate the exact shape of the root canals of the teeth by a cast of their interior, the dental profession was content to ignore the scattered observations of this branch of dental anatomy. Hess, following up the work of Preiswerck, Fischer,

and others, has devised an ingenious method of obtaining a cast of the root canals by filling them with vulcanising rubber, such as is used for dentures, under pressure, and then vulcanising it so that it became hard. The tooth was then dissolved in acid, leaving a solid cast of the canals.

Using this method on a large number of teeth Hess has established the fact that the root canals of the teeth are of surprising complexity. They possess numerous branches, and, instead of terminating in a single apical foramen, frequently break up into a series of fine branches like the delta of a river. Accounts of this work have been published in this country and Hess's work confirmed by Parfitt and others, but the complete text with the original illustrations now receives translation for the first time. The bearing on operative technique is obvious. The problem of filling a root canal so completely that infection cannot penetrate, already difficult, now becomes intensified. Mr. W. H. Dolamore, in his preface, suggests that some method of impregnation by metallic silver, as advocated by Howe, may provide the solution of this problem. An interesting point brought out by Hess is that the canals tend to become more complex as age advances by a process of intracanalicular calcification which forms partitions of dentine in the course of the root canal.

The book is illustrated by many plates (rather confusedly numbered) showing the various forms of canals met with in each tooth of the human series at different ages. It is a notable and important contribution to dental anatomy. The unnamed translator has done his work well.

Bacteriology for Dental Students. By R. B. HERVEY WYATT, M.A., M.B., Ch.B., D.P.H., Lecturer in Bacteriology at Birmingham University. London: Humphrey Milford, Oxford University Press. 1925. Pp. 134. 6s. 6d.

THE problem of teaching bacteriology to a student whose curriculum is already crowded is not easy to solve. Obviously the dental student should at least know the elements of the subject, and rather more than the elements of that part of bacteriology which is concerned with infections of the mouth. This book, written by one who is engaged in lecturing to dental students, is a successful effort to provide a short manual of the subject which, though elementary, yet covers the ground in a readable and accurate manner. The book is intended to accompany a practical course such as is undertaken by the dental students at Birmingham University. So used it should prove of value. The chapter on the bacteriology of the mouth might with advantage be extended beyond the 11 pages given to it. The dental student should know all there is to know about the bacteriology of dental caries and pyorrhœa. It would have been helpful if the author had reviewed the literature in more detail. The work of McIntosh, James, and Lazarus-Barlow is mentioned, but the later work of Kilian Clarke on the *Streptococcus mutans* is not referred to. It is curious that nowhere are Koch's postulates given. The book is well produced and the price moderate. It fills a distinct gap in dental literature.

The Mathematics of Dental Prosthetics. By F. W. Rapp. London: John Bale, Sons and Danielsson. Pp. 42. 5s.

SINCE the days of Bonwill a considerable amount of attention has been paid to the mathematical side of denture construction, and there is no doubt that dental prosthesis has benefited by the scientific principles enunciated. This little book is evidently written by one who has expert knowledge of the prosthetic side of dentistry. The author has devised a set of instruments which, he claims, will make for greater accuracy and increased efficiency. Mr. Rapp considers the problem of denture construction

to be an engineering one, and in a sense this is true, for a denture to be stable and efficient must conform to certain mechanical principles. But the stresses and strains of a denture in any given mouth cannot be calculated exactly in the same way that an engineer can calculate them when using steel or concrete, for the tissues of the mouth differ in different individuals. In spite of the elaborate formulæ which have been worked out by various authors for constructing dentures, prosthesis still remains as much an art as a science. Rule-of-thumb methods often give excellent results, but sometimes fail where more scientific methods may succeed. The non-mathematical reader need not be daunted by the title of this book, for only an elementary knowledge of mathematics is subsumed, while the technique outlined by Mr. Rapp is not difficult. Though it will not solve all the difficult cases met with in practice, this technique is worth a trial.

FAIR WINDS AND FOUL.

A Narrative of Daily Life Aboard an American Clipper Ship. By FREDERICK PERRY. London: Martin Hopkinson and Co. 1925. Pp. 204. 10s. 6d.

Mr. Perry writes with first-hand knowledge, for he served in the American Mercantile Marine and worked his way up from being a "Rufus Hatch cadet" to being a mate in the Pacific Mail Steamship Company and the California Clipper Ships Company. The voyages described in this book are those made by him during the period of his service from third mate to mate. His description of the voyage of the clipper *Continental* from New York to San Francisco is as thrilling as any description of rounding the Horn that we have ever read. These descriptions usually are exciting, and Mr. Perry's narrative is worthy to stand beside Mr. Jack London's "Mutiny of the *Elsinore*" and Mr. Basil Lubbock's account in "Round the Horn" of life before the mast. The *Continental* took 172 days to make out her voyage and she took 21 days to make her westing, water ran very short, and on the 150th day out scurvy appeared. Off the Horn the *Continental* spoke the *Flying Dutchman*—at any rate some ship whose attributes were sufficiently mysterious to have gained it that appellation in less sophisticated days. Mr. Perry mentions that the captain believed scurvy to be contagious and isolated the four cases which first appeared, when no more followed, which confirmed him in his opinion. He tells a gruesome story of an English ship, the *Baltic*, which was towed just behind the *Continental* into San Francisco, having been 185 days out; the *Baltic* had 39 out of a total crew of 42 dead from scurvy, the only survivors being the captain, the carpenter, and the cabin boy. Mr. Perry's narrative is simply and clearly written, and he gives an excellent description of the rigging and sails of a clipper, which makes comprehension of his story fairly easy for a landsman. Altogether a very good book.

INTERPRETACION DE LAS APÉNDICITIS.

Indicaciones Operativas. By Dr. JUAN MARINON. Barcelona: Libreria Medica y Tipografia. M. Rojo. Pp. viii. + 92.

THIS small volume, which is the prelude to a larger one, deals mainly with the author's own experiences, who, however, gives no statistics to show the extent of that experience, nor does he indicate whether it was derived from private or hospital practice. We note that he seems only recently to have encountered a case of perforated appendix without rise of temperature or pulse, though he is familiar with most forms of appendicular trouble. In the indications for operation the rules are not laid down with sufficient clearness, giving the impression that the author has not always the courage of his convictions. He states that the

first attack of appendicitis unfailingly prepares the soil for future attacks which are usually of a much more dangerous character, but later he agrees with Sonnenburg that many of the gastro-intestinal disturbances in the first two years of life are appendical in origin but do not call for interference and leave no ill-effects. The truth is that appendicitis is rare at that age, but when it occurs in definite form it is very dangerous and requires prompt intervention. The author agrees with all surgeons of experience that the ideal practice is to operate in the first 48 hours, but apparently after that would, if possible, leave an abscess to be absorbed in the absence of urgent symptoms. He lays stress on the unexpected difficulties and dangers incurred when operating on quiescent cases, and quotes with apparent approval the surprising doctrine attributed to Roux that no quiescent case calls for operation until it has been free from active symptoms for two years. It is difficult to imagine that many patients, after being free from symptoms for two years, would willingly offer their abdomens to the surgeon's knife, while the author gives his countrymen a bad name for promptitude in that respect. In the subchronic cases (p. 82)—the "grumbling" appendices which are never really acute or really quiescent, but always a source of danger—it would seem hard to find a suitable moment for intervention, if this doctrine is correct. The accepted practice surely is not to give appendicitis a second chance where good reasons exist for suspecting it.

Dr. Marifon's arguments, including the incontrovertible statement that exact diagnosis is impossible without opening the abdomen, all really tend to the same logical conclusion—viz., that in the absence of serious contra-indications every case should be explored. It is to be hoped that in a future book, which he forecasts, he will make his position clear.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains the following articles: Four Cases of Congenital Dextrocardia, including a Case with Sino-auricular Block, by Leonard Abrahamson. All of the cases here recorded showed dextrocardia with complete transposition of the viscera. The article is illustrated by a series of electrocardiograms, one of which reveals a state of sino-auricular block.—Acute Ileocolitis in Children, by Robert Cruickshank. By ileocolitis is understood a condition in which diarrhoea is present, accompanied by toxic symptoms, and in which mucoid stools containing blood and pus are passed. Clinically it is indistinguishable from bacillary dysentery, but occurs sporadically in this country. The stools of 12 cases were examined and *B. dysenteriae* of Flexner-Y type was isolated in seven. It is suggested that the most appropriate treatment is the administration of magnesium sulphate, together with injection of antidyenteric serum.—The Mode of Inheritance of Hereditary Ataxia, by W. Russell Brain. In hereditary ataxia it is probable that the disease depends on the presence of two Mendelian characters, one of which is a dominant and the other a recessive. The mode of inheritance cannot be explained on the theory that the disease behaves as a single Mendelian character, whether dominant or recessive.—Heredity in Polycystic Disease of the Kidneys, by H. W. B. Cairns. An interesting account is given of the occurrence of polycystic diseases of the kidneys in three successive generations of a family living in the East End of London. Myopia was also found to be present in many members of the family, either together with the polycystic disease or separately. The literature dealing with the hereditary transmission of the disease is considered and reference made to several of the published cases. The article is illustrated by a plate showing a polycystic kidney and a liver cyst obtained from the same case.—Critical Review: Cholesterol in Health and Disease, by J. M. H.

Campbell. An introductory account is given of the physiology of cholesterol. Various points are discussed, such as the distribution of cholesterol throughout the body, the relationship of cholesterol to fat and lecithin, cholesterol and lipæmia, cholesterol in the blood during pregnancy, and in various pathological states as jaundice, gall-stones, nephritis, arteriosclerosis, diabetes, and anæmia. The influence of cholesterol upon hæmolysis and the rate of sedimentation of the red cells is also considered.

BRITISH JOURNAL OF SURGERY.—The July number (No. 49) is noteworthy in that in it a series of special articles dealing with pathological anatomy has been commenced. The Editorial Committee announce that it is the intention in these articles—which will eventually form an "Atlas of Pathological Anatomy"—to describe some of the most instructive and historical specimens in the Hunterian Museum of the Royal College of Surgeons of England and in other metropolitan and provincial museums. Illustrations will be both in colour and in black and white, with X ray pictures and drawings of microscopical sections. In this issue nine specimens of sarcoma of the long bones are illustrated and described. There can be no doubt that this series will be of the greatest interest, and of great value as a permanent and convenient record of many supremely instructive specimens.—Sir D'Arcy Power contributes his XVIIth Eponym on Charcot's Joints, in which he describes with much interest Charcot's original contribution.—F. G. Bell discusses at considerable length the characteristics of the teratoid group of testicular tumours.—A. C. Perry has investigated the after-results in 653 cases of operations for malignant disease of the breast. His conclusions are the result of careful analyses, and are worthy of notice.—G. P. B. Huddy, having collected four clinical and four post-mortem cases of urethral pouches, gives an interesting account of their pathology, symptoms, and treatment.—H. Morriston-Davies describes his technique in the operation of extrapleural thoracoplasty.—W. M. Carrick contributes a short note on the pyelographic appearances in cases of polycystic disease of the kidneys.—H. W. B. Cairns publishes some observations on the ætiology and treatment of cystitis.—A. F. B. Shaw and R. P. Smith report six cases of Reidel's chronic thyroiditis; in view of the acknowledged difficulty of accurate readings of thyroid histology, this is a valuable contribution.—In Vol. IX., 1921, 16 cases of surgical treatment of aneurysms of the aorta by wiring were reported, and now five others—three at length—are put on record. The three in detail are by H. M. Colt, C. J. Marshall, and C. P. G. Wakeley. The two former were aneurysms of the abdominal and the latter of the thoracic aorta. It is instructive to note that Colt's and Marshall's cases died of acute dilatation of the stomach, and the post-mortem examination revealed the sacs full of firm clot.—V. Z. Cope's Hunterian Lecture on Extravasation of Bile is here reported.—E. H. Shaw comments upon the pathology of 11 cases of carcinoma of the vermiform appendix.—R. O. Ward contributes a paper on 11 cases of vesical diverticula, dealing with their clinical signs and treatment.—W. E. M. Wardill reports a case of polypi in the bowel causing intussusception.—Sir Cuthbert Wallace has a short note on two cases of advanced carcinoma of the breast treated by the interscapulo-thoracic amputation.—The following short cases are reported:—T. B. Mouat: Two cases of polypus of the stomach. E. T. C. Milligan: Intussusception of small intestine through a faecal fistula. A. Rendle Short: Case of von Recklinghausen's osteitis fibrosa. C. P. G. Wakeley: Ossifying chondroma of a rib mistaken for sarcoma. H. W. B. Cairns: Renal colic as a late complication of nephrectomy. S. Pringle: Cyst adenoma of pancreas. Arthur Evans and S. Cade: Ectopic ovary. H. Drummond: A case of heart suture. Sir Hugh Rigby: Snaring of caput cæci and appendix by a band. W. Adams: Two cases of foreign bodies in the alimentary tract. F. G. Ralphs: Sarcoma of renal pelvis.

PUBLIC HEALTH ADMINISTRATION. ADMINISTRATIVE MACHINERY IN EUROPEAN COUNTRIES.*

I. THE NETHERLANDS.

HOLLAND is a constitutional and hereditary monarchy; the legislative authority is laid with equal responsibility on the Sovereign and the Parliament, the latter consisting of an Upper and a Lower Chamber. Each of the 11 provinces has a Commissioner, nominated by the sovereign, and a representative body whose members are elected for four years. The representative body elects a permanent commission of six members to administer the common laws. The provinces are further divided into 1100 communes, each with its communal council, and an executive body called the Communal College, which consists of the burgomaster, elected by the sovereign, and from two to six aldermen, chosen from among the members of the college.

The public health administration, as organised by the law of 1920, is under the control of a Director-General of Public Health, who is directly responsible to the Minister of Labour for the activities of his department. The Ministry is advised by a Public Health Council, comprising some 15 subcommittees dealing with special departments: general and social health work, infectious diseases, general pharmaceutical work, pharmaceutical and chemical work with particular regard to preparation of commercial chemical products, feeding, hygiene of childhood, tuberculosis, alcohol, cattle and meat examination, "water, field, and air," medical assistance and nursing, venereal diseases, housing problems, statistical researches, and ankylostomiasis.

The country is divided into health inspectorial districts, each with its personnel responsible for the observance of public health regulations. There are also 134 health committees, chosen from local inhabitants, and appointed by the Provincial Governor. Neighbouring communes appoint a special doctor for the schools or engage one of the doctors residing in the district to fulfil the duties of this officer. At Amsterdam there is a communal medical and sanitary service with a director and several senior officers. At The Hague there is a communal medical service and a school medical service, each with its director. At Arnhem there is a school medical service, but no communal medical service. At Rotterdam and at Utrecht the two services are amalgamated. There are no provincial services. The Government intends to lay before the National Assembly a Bill regarding the health services as soon as circumstances permit. It has been proposed to appoint school doctors in each district, but this proposal has not so far been carried into effect.

There are no provincial disinfection services in Holland such as exist in Belgium. Provincial services now exist in certain provinces (Gelderland, Friesland, Groningen, Northern Holland, Overijssel, and Limburg), but they have been established by associations such as the "Green Cross" or the "White Cross"; there exist also certain communal disinfection services approved by ministerial decisions. These associations maintain disinfection services approved by the Ministry, and receive a fixed subsidy on this account in the same way as the communes. The State grants to the communes a subsidy of 50 per cent. of the cost of establishing, extending, and maintaining the disinfection service.

Organisation of Health Inspection.

Article 2 of the law on Protection of Public Health (1919) provides for the establishment of a Health Council to advise the Government in regard to any measures it may take to promote public health.

* Based on a Series of Reports on National Health Organisation to the Health Section of the League of Nations and on Statistical Handbooks prepared by the Section. Obtainable in Great Britain from Constable and Co.

Article 3 of the same law entrusts the duty of health inspection to (a) the principal public health inspectors; (b) the public health inspectors and officials assisting them; and (c) the Health Commissions. The Burgomasters have to send to the Inspector-General a monthly return of the deaths which have occurred in their communes, and they are also bound to inform as soon as possible the appropriate inspector of the departure, death, or if they are aware of it, cessation of practice of any doctor, dentist, or chemist or midwife in their commune. Health Commissions are established for each commune which contains more than 18,000 inhabitants. Several communes, the joint population of which does not exceed 40,000, may have a Health Commission between them. The expenses of these Commissions are borne by the commune, but the salaries of their secretaries are paid by the State Treasury. The decisions of the communal councils regarding matters of public health may only be promulgated, supplemented, modified, or repealed if the Health Commission established by the commune has been consulted.

Members of the Health Council are entitled to enter all public buildings, schools, factories, hospitals, &c., throughout the kingdom in order to see that the law is properly applied, and to enter places of residence to obtain information regarding the state of such places. Members of the Local Health Commissions have the same rights within their respective district only.

Registration.

The statistical work is organised by a Central Bureau of Statistics, established in 1899. The bureau publishes at regular intervals information regarding the population, births, deaths, and notifiable diseases. Registration of births, deaths, and marriages is compulsory, and the system is based on the Code Napoléon. The declaration of a birth must be made within three days, and must include hour and place of birth, names and address and profession of both parents, name, address, profession, and age of the declarant and two witnesses, religion of parents, and time and place of their marriage. "Stillborn" children include premature infants and those dying before registration. The Communal Registrar is the sole competent authority for authorising burial and the death must be certified by the medical practitioner. If death occurred without medical attendance, the body has to be seen by the "médecin de l'état civil." Information required on the certificate includes names, age, address, civil status, religion and occupation of the deceased, of the husband or wife, of the declarant, and the place of death.

Both with births and deaths certain communes ask a larger or smaller number of further questions for statistical purposes. The information relative to infant mortality is remarkably complete.

II. BELGIUM.

The kingdom of Belgium, the most densely populated country in Europe, is an independent constitutional monarchy, and is divided into nine provinces, each having a governor, nominated by the King, and a Provincial Council, which is partly elected every four years and partly a permanent standing committee of six members. There are 41 arrondissements, which are groups of communes under Commissioners, each of the 2638 communes having self-government in all local matters, and comprising a burgomaster, nominated by the King, an elected council, and an executive "college," selected from the council.

The laws controlling public health administration fall into three main groups: (1) Those giving the National Government, provinces, or communes power to issue regulations within defined limits; (2) those specifically enumerating the rules and regulations that are to be observed; (3) certain international conventions.

The central public health administration is part of the functions of the Ministry of the Interior and of Hygiene, which has two quite separate divisions,

the Administration of Public Health and the Central Statistical Department. There are also various technical services and advisory bodies.

Seventeen provincial medical commissions exercise a supervision over medical practitioners, midwives, and dentists, and are responsible for the observance of regulations relating to public health. Provincial inspectors of hygiene have recently been appointed, with wide executive responsibilities and duties. They visit and advise local administrations as to their obligations and public health interests, and inspect the services or institutions within the jurisdiction of local sanitary authorities. They forward monthly reports to the central administration dealing with their work, and special reports after any inspection which has reference to the sanitary condition of a particular area or the outbreak of a serious epidemic. Such reports include the results of laboratory investigations, prophylactic measures, and the tracing and disinfecting of carriers. The inspectors also forward every ten days summaries of all notifications received, with a short summary of the state of the public health in their area. Laboratory and disinfection services are reported on monthly.

The provincial authorities provide certain technical, laboratory, and disinfection services. Certain communes combine for public services, such as water distribution and hospitals, but there is no district arrondissement public health administration. All communes that have three doctors or two doctors and a pharmacist have local medical commissions similar in their activities to the provincial medical commissions controlled by the central health administration. There are hygiene services in some of the towns and larger communes.

Statistical Work.

Every commune maintains registers of population, births, deaths, and marriages, and returns to the Central Statistical Department the basic tabulations from these registers. Births must be registered by the father, or other person present, before two witnesses, at the *mairie* within three days. In the towns and some of the communes there is a system of verification, whereby the father notifies the *mairie* within 24 hours, the official notifies the local "*médecin de l'état civil*," who visits the home to verify the data, fills up the certificate, and hands it sealed to the father, who then makes his declaration at the *mairie* within three days. "Stillborn" children include also those dying before registration—i.e., within three days of birth. They are recorded in a special register, separate from the ordinary births or deaths register. Deaths are notified by the nearest relative to the "*officier de l'état civil*," who is the sole competent authority to authorise burial. The registrar visits the house to satisfy himself that death has occurred, although in larger communes he delegates this duty to a "*médecin de l'état civil*." In some cases the certificate of the attending physician is accepted in lieu of this visit. Certification of the cause of death is not compulsory, but medical practitioners and other persons having knowledge of the cause of death are urged to give this information to the authorities. There is no system of medical verification of these particulars.

III. SPAIN.

The kingdom of Spain, with a population of 21 millions, is a hereditary and constitutional monarchy, the legislative authority being exercised by the sovereign in conjunction with the two houses of the Cortes. There are 49 provinces under their respective governors, who act under the direction of the elected provincial council. The council meets yearly, and is represented by a permanent "standing committee." Each commune has its own elected council, with a mayor, who acts as chief executive officer and justice of the peace. Neither the executive nor the Cortes may interfere with the provincial, communal, or municipal administrations, except when such authorities exceed their legal powers to the detriment of public interests.

The responsibility for the organisation of general health services rests on the General Health Department of the Ministry of the Interior, under a Director-General of Public Health. The four main sections are :

1. *The Section of Public Sanitary Institutions.*—This controls such health institutions as the National Institute of Hygiene of Alfonso XIII., the general sanitary epidemics organisation, and the special institutions for combating particular diseases—e.g., tuberculosis, cancer, malaria, leprosy, &c.

2. *The Health Section of the Interior.*—This section, under an inspector-general, controls and directs the activities of the 49 provincial inspectors, and also the medical, pharmaceutical, and veterinary services of the kingdom.

3. *The Health Section of the Exterior*, also under an inspector-general, is responsible for all sanitary measures at ports and frontiers.

4. *The Administrative Section* concerned with general measures.

The statistical office of the department compiles vital statistical data from the material received.

In each province there are sanitary corps, maintained by a 2 per cent. levy on each municipal or communal budget. Municipalities generally have their own municipal officers paid from municipal funds. Catalonia has a specially adapted health service of its own, combining under one administration the public health activities of the four Catalonian provinces.

The Royal Decree of March 8th, 1924, issued and signed by the Military Directory, provided for the reorganisation of municipal services and outlined their responsibilities towards public health matters, i.e. :

In Towns of not more than 15,000 Inhabitants (Art. 201).—Supervision of all drinking water; disposal of waste matter, excreta, &c.; inspection and improvement of dwellings, prohibition of insanitary habitations, &c.; sanitary supervision of public highways, stables, slaughter-houses, markets, lavatories, baths, and cemeteries; supervision and improvement of cesspools and prohibition of their use where they prove to be insanitary; inspection of schools and school-children; control of infectious diseases and measures to combat the outbreak of epidemics; vaccination of all children before the age of six months; revaccination of population where necessary.

In Towns of over 15,000 Inhabitants (Art. 204).—Removal of cesspools and gradual substitution of modern systems for dealing with waste matter and excreta; census of dwellings under direction of municipal medical officers of health; organisation of pure water-supply which will provide a minimum of 200 litres of pure water per day per person.

In Towns of over 30,000 Inhabitants (Art. 205).—Provision and maintenance of a municipal laboratory for the analysis of foods, drinks, drugs, and similar products, and for other duties in the interests of the inhabitants. Establishment of one or more disinfecting stations for beggars, &c., and one or more free bath-places.

In all Towns over 15,000 Inhabitants (Art. 206).—Compulsory vaccination against small-pox, provision of adequate services for combating outbreaks of infectious diseases, especially typhoid and typhus fevers, diphtheria, infantile cholera, trachoma, and tuberculosis.

The statistical work is under the control of the Director-General of Statistics, who is advised by a General Council of Statistics. Registration of births, deaths, and marriages is compulsory, and the magistrates of each commune are responsible for the custody and maintenance of the registers, the records being forwarded monthly to the Provincial Statistical Bureau. Births must be recorded within three days by the father or other person present at the time, with the age, profession, and nationality of the parents. The registration of stillbirths has been obligatory since 1919, and must be effected within 24 hours. "Stillbirth" includes babies dying within 24 hours of delivery. Deaths must be declared within 24 hours, accompanied by a medical certificate authenticating the fact and cause of death. In the event of sudden, accidental, or violent death a post-mortem examination is made by the judicial medical officer, usually assisted by a private practitioner.

(To be continued.)

Reports and Analytical Records.

B.D.H. CAPILLATOR.

(BRITISH DRUG HOUSES, LTD., 16-30, GRAHAM-STREET,
CITY-ROAD, N. 1.)

THE pH value is a number used to express the active acidity or alkalinity of any fluid, the pH of pure water at 18° C. being taken as the standard of absolute neutrality, where the figure is usually given as 7. The concentrations of H and OH ions here are exactly balanced, and the balance will be upset by the addition of any acid or alkali. The colorimetric method is the most widely used one for determining pH values and in the hands of those who understand the procedure the technique is comparatively simple, little apparatus being required and the test taking practically no time. The British Drug Houses have submitted to us a pH capillator which provides an improved method. The capillator consists of a white card on which is mounted a series of capillary tubes in which buffer solutions containing an indicator are sealed. The tubes are mounted three together, thus forming a series of strips of colour, each strip being about $\frac{1}{4}$ in. wide and marked with its exact pH value. The series of colour standards on each card covers the complete colour change of the indicator. The determination of pH is carried out by using a capillary tube as a pipette and measuring by this means equal quantities of the liquid under examination and indicator, mixing the two in a small watch-glass, and then drawing the mixed liquids back into the capillary tube. The colour of the mixed liquids is then matched against the "Capillator" standards. Owing to the small quantity of fluid required for a test (one drop is sufficient), the capillator is invaluable for the determination of the pH of such liquids as urine, saliva, tears, plant juices, and innumerable other organic fluids. Another advantage of the capillator method is that the pH of slightly coloured fluids may be determined directly without the use of any compensating device, such as is necessary when using test-tubes for comparison purposes. Owing to the very thin layer of liquid in the capillary tubes, the inherent colour of urine and other similarly coloured liquids is negligible. To determine the pH of any liquid, it is necessary first of all to choose a suitable indicator. A preliminary test is made with B.D.H. universal indicator, the range of which is from 3.0 to 11.0; thereafter a suitable particular indicator is chosen, such as, say, thymol blue (pH 1.2-2.8), bromo-cresol purple (pH 5.2-6.8), or phenol red (pH 6.8-8.4), and the accurate estimate is thus made. The compactness of the capillator is such that a complete set comprising nine or ten colour standards of an indicator occupies a space of only 3 in. by $4\frac{1}{2}$ in. by $\frac{1}{4}$ in. It is thus possible to carry in the pocket a number of capillators of different indicators covering a large range. This valuable modification of the colorimetric method is due to Dr. Henry A. Ellis.¹

KHARSULPHAN.

(BURROUGHS WELLCOME AND CO., SNOW HILL BUILDINGS,
LONDON, E.C. 1.)

In order to simplify the treatment of syphilis by the administration of arsenobenzol compounds, Kharsulphan has been manufactured under the licence of the Board of Trade and biologically tested under arrangements approved by that Board, while the Ministry of Health authorise the use of the preparation under the Public Health (Venereal Diseases) Regulations. The preparation is intended for subcutaneous and intramuscular injection only, and its advantage is that no elaborate technique is

required either in preparing solutions or in making injections. The dose is simply dissolved in 1 c.cm., or more, of saline or distilled water in the barrel of the syringe and is then ready for immediate use. The dose for each patient must be prepared separately as required, and on no account be stored or allowed to stand. It is readily soluble and there need be no delay in preparing individual doses. For subcutaneous or intramuscular injection the commencing dose should be 0.15 g. and the following range of doses is given. Men, 0.15 g. to 0.6 g. (approximately 2-9 gr.); women, 0.15 g. to 0.45 g. (approximately 2-7 gr.); children, 0.15 g. to 0.3 g. (approximately 2-4 gr.); infants, 0.05 g. (approximately $\frac{1}{4}$ gr.). In intramuscular injection strict asepticity must be observed. The skin should be painted with iodine, and the syringe and needle boiled for five minutes in a 5 per cent. solution of carbolic acid. Treatment should commence with small doses at intervals of two or three days and as the dose is increased the interval should be lengthened. It may have to be continued for many months. The drug is contra-indicated in cases of advanced visceral disease, and caution is necessary in cases of arterio-sclerosis, diabetes, advanced nervous disorders, and certain skin diseases.

CREAM OF NUJOL.

(ANGLO-AMERICAN OIL COMPANY, LTD., ALBERT-STREET,
CAMDEN TOWN, N.W. 1.)

The properties of Nujol have been brought before our readers in these columns on previous occasions. We have now received from the firm a new product, Cream of Nujol, in which Nujol is combined with agar-agar for use in constipation. The preparation contains no cathartic ingredient, saccharin, or sugar, and therefore can be prescribed with safety for obese or diabetic patients, and others where anything like active purgation would be harmful. The preparation is directed to the needs of those with intestinal stasis particularly in atonic form, and it can be employed over extended periods in obstinate cases without risk. It can be diluted with milk or water if it proves more palatable in this manner, and the emulsion is pleasantly flavoured.

NOCTAL.

(W. DEDERICH, LTD., STANLEY HOUSE, DEAN STANLEY-STREET,
WESTMINSTER, S.W. 1.)

Messrs. Dederich, Ltd., are the agents for the firm of J. D. Riedel of Berlin, from whom we have recently received for clinical trials a preparation of isopropyl barbituric acid termed noctal. We are informed that the clinical experiences of the specific under the hands of Berlin physicians have been satisfactory. Noctal is supplied in tubes of ten tablets of 1 gr. each, the dose being from one to two tablets.

MEAD'S RECOLAC.

Messrs. Mead, Johnson and Co. ask us to correct a statement made in our issue of June 6th in this column with reference to the above preparation, that "full instructions how to prepare these foods are issued with the preparation." The company say that their "policy does not permit them to issue directions on or with their foods to the general public, as directions are only supplied to the medical profession, and for their prescription only." Our note referred, of course, only to the position as between the company and our professional readers, and we learn that feeding instructions will be gladly supplied to doctors through the distributors: Brooks and Warburton (A. D. S. Co.), Ltd., 40-42, Lexington-street, London, W. 1.

TILBURY SEAMEN'S HOSPITAL.—Since the new wards were opened towards the end of June the daily average number of in-patients has increased by nearly 50 per cent. A unique feature of the hospital is a separate wing exclusively for the treatment of Indian seamen, which was provided by the generosity of Mr. P. G. Singhanee, of Poona, who gave a lakh of rupees for the purpose.

¹ An Explanation of Hydrogen-ion Concentration. The Capillator Method for the Determination of Acidity and Alkalinity in General Practice. London: H. K. Lewis and Co., Ltd. 1923.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 26, 1925.

THE PROBLEM OF THE MENTALLY DEFECTIVE.

THE Commissioners in Lunacy, one of the most valuable governing bodies in this country, have just issued their eleventh annual report, that is to say, the Report of the Board of Control. It is, as usual, full of useful information, and bears abundant witness to the keen industry of the Commissioners and their inspectors. Many of the points dealt with have been touched on in previous issues of *THE LANCET*.¹ The most important feature, however, of this report is the section on mental deficiency. The Commissioners apprehend a grave danger to the country unless the local authorities, and with them the general public and all governing bodies who bear the responsibility for defectives, regard their duty towards these unfortunate people very seriously, and put forth the utmost exertions to deal with their plight. The problem, like all national problems, is many-sided, but its two gravest aspects are undoubtedly, first, the provision of institutional accommodation, and, second, the coöperation towards one end of the four bodies who deal with mental defectives. On the whole, the local authorities are very active in their duty of ascertainment, and last year they discovered 12,300 new cases. Their returns, however, show that of those notified by local education authorities, 2197 remained undealt with at the end of the year, and that 1193 otherwise ascertained are still "subject to be dealt with." No action has yet been taken in these 3390 cases, and the reason that suggests itself to the Board of Control is significant enough to rouse the most apathetic. Local authorities are disheartened by their constant inability to obtain vacancies. Some have applied in vain to 30 or 40 institutions—one, in fact, to 156—without success, and it is hardly surprising that efforts should at last be given up.

The provision of colonies for mental defectives was seriously hampered by the war, but many of the restrictions have since disappeared, and the Board of Control is always eager to consider well-planned schemes. This is the only real solution—that every local authority should at once do its utmost to purchase a suitable estate and found a colony for its mental defectives. "Existing institutions," say the Board, "are full, and local authorities can no longer rely on charitable institutions or on the Poor-law for this provision. Unless, therefore, they give immediate consideration to this matter the beneficent intention of the Mental Deficiency Act will be hampered and will almost cease to operate. We take this opportunity of making an urgent appeal for immediate action, and we do so the more confidently because every year reveals clearly the terrible consequences of the neglect to afford this means of protection." These are strong words, uttered by those who are best qualified to speak on the subject. Let us hope that those to whom they are addressed will see their truth and act on them. Many authorities have already done so, and the names are given of 20 who have colonies in existence, six who have purchased estates, and 17 who are taking steps towards this provision.

The second need, that of real coöperation between different governing bodies, is almost as urgent as the first. Besides the local authorities, who are the mental deficiency committees of the county or county borough councils, three others come into contact with defectives. They are the committees of mental hospitals, the staffs of H.M. prisons, and the governors of industrial schools and reformatories. The Board of Control points out that there are three ways in which coöperation between medical officers would greatly help towards the efficient control and care of mental defectives. One is that the medical officers of the local authority and the local mental hospital should meet and visit together the institutions for which each is responsible. It is the Board's policy to withdraw gradually all defectives from mental hospitals, beginning with children and young persons, and this policy would be much simplified if the understanding between these two departments were more complete. The melancholy progress of defectives in and out of mental hospitals, with intervals in prison or the workhouse, would become considerably rarer. A second way is for the medical officers of the local authority and those of the prisons to confer and visit one another's institutions. The wider range of study of mental deficiency which is available in a certified institution would be an advantage to prison medical officers, while the county medical officer might find in prison many types of defectives with whom he may have to deal on their discharge. Many forms of deficiency may be recognised by one authority and not by the other, and interchange of histories and free consultation would be of the utmost value. Thirdly, if the managers and medical officers of industrial schools and reformatories met the local authorities and their medical officers, the latter could take over young defectives and give them the protection and training without which they would certainly sink into pauperism and crime. A break in care and supervision, especially in early youth and adolescence, has led to periods in prison or in Poor-law institutions which are harmful to the defective, and render him less amenable to kindly control when he comes at last into an institution or a colony for defectives.

We have mentioned two only of the manifold facets of this vital problem; the others will be found in very great detail in the report itself. The present administration of the Mental Deficiency Act is a dark shadow on the social life of our country, and we shall be gravely at fault if we do not do our best to improve matters. We are fortunate in that our advisers and judges in this matter are as conscientious and as determined as this report shows them to be.

LONDON WATER.

MOST large cities now draw their water from unpolluted sources, some of them having laid hundreds of miles of aqueduct to remote and rainy mountain slopes. London has been content to drink from its own watershed, and after taking what is available from deep borings down to the chalk to obtain the remainder—being much the greater part—from three rivers, the Thames, the Lee, and the New, all highly polluted by human excreta. The labour involved in purifying this water is enormous, and to ensure safety constant vigilance is demanded from the Water Examination Department of the Metropolitan Water Board, which came into existence in November, 1905. Sir ALEXANDER HOUSTON, in his Nineteenth Annual Report to the Board¹ sets out the results

¹ THE LANCET, 1921, ii., 723.

¹ London: P. S. King and Son. 15s.

of the chemical and bacteriological examination of the London waters for the 12 months ended March 31st, 1925, but although the results are duly set out as stated, the Report is much more than that, for HOUSTON has become the champion of London water as an abundant, cheap, safe, and palatable beverage, and his account of the doings of the Board becomes more and more of the nature of an epic. The opening of the great reservoir at Littleton by the KING on June 13th occurred since the period covered by the report, but HOUSTON foreshadows the value of increased water storage to the health of London. The reservoir doubles the storage capacity for Thames water and provides effectively against periods of drought. Procrastination facilitates enormously the purification of river water, and in this instance saves both time and money. The amount of solid matter contained in untreated Thames water is round about 100 pounds per million gallons, but in flood time it is still further increased, and during one January week in 1924 a ton of solid matter would have entered the Board's reservoirs with every four million gallons of water unless it had been possible temporarily to close the intake. The Littleton reservoir affords tremendous relief, for when full it would, in HOUSTON'S words, supply the whole world with a gallon of water per head for three days. These great settling tanks afford the opportunity of adequately sampling the London water before filtration, and the examination of the pre-filtration water goes on steadily. The loss of vitality to pathogenic microbes has now been correlated with certain physical, chemical, and bacteriological changes which occur in river water as a result of adequate storage, and it has become increasingly possible to deduce the margin of safety previous to liberation. The influence of time in destroying the vitality of pathogenic bacteria is well known to bacteriologists, and the new storage increases this safety period.

In the opposite direction of rapid purification the work of the Water Examination Department goes steadily on. The country owes much to HOUSTON'S determined advocacy of chlorination as a safe and ready method of purification. Recently the matter has been carried one stage further in an exhaustive test of super-chlorination with subsequent dechlorination. The advantages of this process are that, even with a very short period of contact, sterilisation can be made effective and serious taste troubles avoided. A drawback is the constant supervision required which lays added responsibility on the staff. The average dose of chlorine now used for Thames river water is 1 in 2.3 millions, and, so treated, 78 per cent. of the samples passed the test of containing no colon bacilli in 10 c.cm. of water. In regard to taste troubles, HOUSTON is content to remark that two million people have used this chlorinated Thames water since May, 1916, and he has not heard a single complaint. The New River supply has now been chlorinated for the sixth consecutive year, taste troubles having been avoided by skilfully contrived doses of chlorine and permanganate. Now that Mr. B. A. ADAMS'S work has succeeded in tracking down the iodoform taste of chlorinated water to atmospheric impurity, it looks as though the problem is within sight of complete solution, and, as HOUSTON puts it, the boggy of taste will before long largely be eliminated.

The Report contains much else of value and interest. In one section HOUSTON sets out a simple test (quaintly called "the three-star presumptive test") for colon bacilli in drinking water which gives reasonably accurate results under conditions of extreme simplicity.

The Water Board is interested in living organisms other than bacteria in relation to the Thames. HOUSTON still regards the Thames as a salmon river in a potential sense. The water at Hampton is well aerated at all seasons of the year; it is only in the lower reaches that no oxygen remains to maintain the possibility of fish life. Were it possible even temporarily to purify the tidal portion of the Thames during the descent of the smolts and ascent of the salmon, there is nothing in the state of the upper river to render salmon life impracticable. This is a great aim which not only keen fishermen may hope to see realised within their lifetime. Birds are not considered desirable visitors at the reservoirs. Gulls, so far as is known, do not suffer from the water-borne diseases that afflict human beings, but their droppings interfere with chemical control of the water. Considerable attention has been paid during the year to frightening gulls away from the West Middlesex works and other wild fowl from the aqueduct at the East London Works. But there is no page in the Report which does not contain interest for some class of reader, and we express again cordial regret that the Report is issued in the foolscap form so dear to precedent and so inimical to circulation. Every householder ought at least to read HOUSTON'S repeated declaration that drinking water should be obtained direct from the rising main and not after a more or less protracted sojourn in a tank in the roof. And he should see that he gets it.

A CONFERENCE ON DRUG STANDARDS.

THE first international conference on the standardisation of biological products, which was held at Edinburgh in July, 1923, under the auspices of the League of Nations Health Organisation, adopted a programme of research into the best methods of testing various drugs and selected a certain number of laboratories in different countries where these methods could be investigated and the results compared. The National Institute for Medical Research of Great Britain was used as a clearing house for the investigation and correspondence this work entailed, and a second conference, under the presidency of Dr. H. H. DALE, of the Institute, has just been held at Geneva to review the work of the past two years. The main subject of discussion was the standardisation of such products as pituitary and thyroid extracts, insulin, digitalis, salvarsan, and ergot, and the conference attained in the end a remarkable degree of unanimity. For digitalis, pituitary extract, insulin, and salvarsan a system of international standards was agreed upon; the iodine content was considered sufficient index of efficacy in thyroid extract, and the questions of ergot, extract of male fern and other vermifuges, and the vitamin-content of cod-liver oil, were held over for further investigation. The article by Prof. J. C. DRUMMOND, on p. 679 of our present issue, indicates the wide limits within which the vitamin-content of cod-liver oil may vary. It is probable that a separate specialist conference will investigate vitamin standards. The discrepancy which at present exists between one preparation of pituitary extract and another is shown by the fact that in one country, where control conditions are particularly good, a series of commercial preparations showed a range of activity of from 1 to 80. At the conference it was decided that the dry (acetone) extracted substance of the fresh posterior lobe of the pituitary recommended by Prof. C. VOEGTLIN to the Edinburgh conference should be adopted as standard. The Health Organisation of the League

will be responsible for the distribution of small quantities of this preparation which will form national standards; the physiological activity of $\frac{1}{2}$ mg. of the above preparation is to constitute a unit of activity, and preparations should be labelled according to their potency. Insulin has from the first been relatively well standardised owing to the action of the Toronto committee who introduced it; but different workers have got optimal results with different methods, while variations in animal reaction and in climate have led to widespread discrepancy between units as determined in different countries. A dry, stable preparation of insulin hydrochloride, which has been made at the National Institute for Medical Research, London, has been accepted as the standard, and a unit of insulin, corresponding to that biologically measured by the Toronto committee, is now defined as the physiological activity of $\frac{1}{2}$ mg. of the standard preparation. The international standard of digitalis is to be a dry powder of the leaves of *Digitalis purpurea*, similar to that proposed at the first conference. Experiment on cats is to define the activity, and further methods will be investigated; it is arranged that the standard shall be distributed internationally, and its activity will be annually controlled. The subject of salvarsan is of special interest, because the patents governing its production and that of its most important derivatives expire in the course of a few years, after which any factory in the world will be free to make them, and may flood the markets, legitimate and illegitimate, with products of widely varying toxicity. Standards for these substances are to be prepared and deposited in the original laboratory at Frankfurt, just as the standard samples of antitoxic sera are kept at the Copenhagen Serological Institute, those of pituitary extract at Washington, and those of insulin in the Hampstead Institute.

THE LATE SIR FRANCIS DARWIN.

REFERRING in 1912 to "The Life and Letters of Charles Darwin," Sir Charles Sherrington remarked that "by the vivid presentation of the life, character, and work of one of the greatest naturalists the world has ever seen, by the modest self-effacement of its author, and by its literary charm, it has undoubtedly had a quickening influence on the advance of science in modern times." Sir Francis Darwin will perhaps be remembered best by this admirable biography of his father, with whose later work he was most intimately connected. Although he graduated in medicine while at St. George's Hospital, he never practised, but returned to his father's home at Down, where for eight years he acted as assistant and secretary. His name appeared on the title-page of Charles Darwin's "Power of Movement in Plants," and later at Cambridge he devoted much of his energy to research on the same subjects and provided a wealth of experimental evidence justifying the idea of the localisation of sense organs, which is now generally accepted. His interest in plant physiology did much to advance Cambridge in this study, and his teaching by lectures and text-book was most helpful to students; the "Elements of Botany," although written for the preliminary medical course, was a safe introduction to the study of plant life. As President of the British Association in 1908, he discussed the problems of stimulus and reaction in plants, and by the mnemonic hypothesis—the idea that stimuli are not momentary in effect, but leave a trace or record—somewhat expanded, and also supported, his father's views on the origin of species. By his death science loses a considerable personality. His distinction did not clash with his sense of humour, his hatred of insincerity, nor his appreciation of the good work of others.

Annotations.

"Ne quid nimis."

THE SURGEON AS A TECHNICIAN.

UNDER the modest title "De Minimis" Mr. Arthur Edmunds calls attention, in a communication appearing in our present issue, to an aspect of surgery which has of late been seldom made a subject of prominence—namely, the technical details of the surgeon's art. Every surgeon has his own special methods by which in years of practice he has learnt to facilitate his work, but the great surgeons early in the last century took infinite pains to build these methods into a technique having a virtuosity comparable to that of the pianist, by which they triumphed over difficulties and astounded the onlookers. Those were the days when theatre galleries were crowded to see Fergusson amputate a hip in 12 seconds, or to watch the faultless perfection of an operation by Dupuytren or Syme. These men worked when anaesthesia was unknown and when the slightest clumsiness meant the prolongation of the agony of the patient, and it was not for mere spectacular effect that they spent, in acquiring supreme manipulative skill, so much labour as they did. When the enterprising young operators went over to Paris, where bodies were cheap and where perhaps for that very reason the surgeons led the world in technical brilliance, the aim to gain pace and precision was always humane in origin. One English surgeon, not even now an old man, went to Paris to tie the common iliac artery 19 times, so that he might learn to avoid wounding the peritoneum, naturally held in pre-Listerian days to constitute an almost fatal disaster. To-day the whole situation has changed. With the perfection of anaesthetics and of asepsis, the urgent necessity for such manipulative dexterity and speed has gone. The surgeon's work has been made so much easier in one sense—though so much harder when its range is remembered—that he is apt to forget that it really does matter how an operation is done; and authors have chronicled in our pages before now the details of surgical procedures where unimpeachable as the objects have been, the methods have had no reason for commendation. The results in such cases may have been generally good, or unfortunate issues may have not been traceable to faulty technique, for the human body is amazingly tolerant; but none the less the operation that is performed with an accurate knowledge of anatomy and a precise conception of the projected steps must remain the proper ideal. But there are difficulties in obtaining the experience thus necessitated. The old surgery consisted largely of amputations and of operations easily carried out on the cadaver. To-day the teachers cannot get the cadavers for the students, and if they could, they would be of little practical use for the carrying out of instruction in the operations on the viscera, which form now so large a bulk of surgery. It is only on living animals that the student could be taught real technique exactly, and such studies are most strictly prohibited in this country, where even the trained surgeon is not allowed to develop his skill in this way. In America, in some of the medical schools at any rate, regular animal hospitals have been organised, in which the student is taught the technique of his art. He is taught to operate upon anaesthetised animals, and to care for his animal patients. The modern surgeon is assisted by anaesthesia and asepsis, adjuvants of far-ranging power, and every day there are being placed in his hands some new products of mechanical or optical skill; but for the development of personal dexterity the medical curriculum makes little provision. Are the difficulties of filling this gap insuperable? The pessimistic view, that we have seen taken in more than one place, that the modern student, wearied with the burden of an overgrown curriculum, reaches the final examinations unable to outline the simplest amputation, and without ever having been taught how to hold a knife or

to tie a knot—this view is exaggerated, but there is no doubt that the importance of technique is no longer sufficiently insisted upon by teachers. Their responsibility here is difficult to discharge, and we may see the employment of elaborate dummies or models. Rightly used these could be of enormous service.

NOTIFIABLE DISEASES THROUGHOUT THE WORLD.

THE second annual report on the prevalence of epidemic diseases prepared by the Service of Epidemiological Intelligence and Public Health Statistics of the Health Section of the Secretariat of the League of Nations¹ reviews the statistics for 1924 of the diseases notifiable in 29 European, 17 African, 20 American, and 16 Asiatic countries, together with Australasia. The tables collected in this volume are prepared from the current records published in the Monthly Epidemiological Reports of the League, and are sent to the National Health Services for verification. The short summaries of the movement of the various epidemic diseases during the year provide a review of the general situation. The incidence of plague has been higher than in any of the five preceding years, mainly on account of its prevalence in Northern India. On the other hand, Egypt, Iraq, and East Africa record fewer cases than in 1923. Cholera was rare outside India and entirely confined to Asia, except for nine cases in European Russia. In India it was more prevalent than in the two previous years. Yellow fever reappeared in Central America and 18 cases were reported from British West Africa. The incidence of typhus was lower in all parts than at any time since the war; it would seem that the great pandemic has now run its course. There was a serious epidemic of relapsing fever in Nigeria, but elsewhere the incidence diminished rapidly. Small-pox markedly increased in North Africa and North America, particularly among the natives. The fatality, however, was very low, only two deaths being reported from Africa. In South America there has been a definite decline of this disease. In Europe the situation has improved, although England and Poland report an increased incidence. Enteric fever remains as in previous years, except for a slight increase in Europe; the steady decline observed between 1894 and 1914 appears to have ceased for the time. Serious epidemics occurred in the Balkans. Malaria still constitutes a serious problem in Russia and the Balkan States. The Commission believes that the rise during recent years is due to climatic conditions favouring the spread of the mosquito; and to mass movements of peoples carrying with them new strains of plasmodia. Reliable information on Malta fever is only available for a few countries; it has been reported as far south as Southern Rhodesia and the Union of South Africa, as well as in the West Indies and United States. The great influenza pandemic of 1918-19 has been followed by recrudescences of varying intensity; the epidemic of 1924 was less severe than that of 1921-22, and was most marked in Western Europe. The incidence of encephalitis lethargica was lower in America and in Europe, with the exception of Great Britain, where it was unusually prevalent. In former years most cases occurred in winter, but in 1924 the majority were encountered during the spring. In spite of the serious epidemic in this country the death-rate was low, about 20 per cent., and abortive attacks were frequent. Japan suffered from an unidentified epidemic of the central nervous system, with a mortality of 55 per cent. A severe epidemic of acute poliomyelitis occurred in Iceland, with a mortality of 37 per cent. A large number of cases were recorded in Sweden and in England and New Zealand. Cerebro-spinal fever is notifiable in almost all parts of the world. A period of high prevalence followed the war, but since then there has been a decline. Several important outbreaks have occurred in the grass lands south of the North African desert belt. There seems to have been a slight but

by no means general decline of measles during 1924, but, like scarlet fever, whooping-cough, and diphtheria, the disease is not completely reported, and definite conclusions cannot be drawn from the statistics collected here. The seasonal distribution of measles is seen to vary in different countries, and it tends to cause widespread epidemics periodically. The report is lavishly illustrated with maps and diagrams. The compilers admit that for several reasons it is not absolutely complete, but none the less it is an extremely valuable source of information for the student of epidemiology.

THE ROTUNDA HOSPITAL REPORT.

THE clinical report of the Rotunda Lying-in Hospital for the year 1923-24 appears in the August number of the *Irish Journal of Medicine*. As in previous years the report is full and comprehensive and includes a detailed statement made by the Master, Dr. Gibbon FitzGibbon, who summarises the year's work and discusses the various forms of treatment adopted. This summary should be read by all who are interested in midwifery, as it contains many original observations and gives an excellent idea of the work carried out at this well-known Dublin hospital. Attention is here called to a condition, arising wholly in primiparæ, "and described as persistent primary uterine inertia"; its pathology and the treatment adopted are reviewed, and notes appended of eight illustrative cases. In touching upon his method of inducing labour by a soft rubber tube, Dr. FitzGibbon takes exception to the description given of this method by Dr. T. Watts Eden,¹ who writes: "as much of the tube as possible is then gradually passed through the cervix. The excess should be cut off and the vagina packed to keep the tube in place." Dr. FitzGibbon affirms in the treatment of over 100 cases by this means he has never failed to pass the whole of the tube into the uterus. His object in devising the method was to have nothing passing from the uterine cavity into the vagina and to avoid having even iodoform gauze in the vagina to interfere with free drainage. Contrary to usual practice forceps are advocated in the report for the delivery of the breech, and the author considers them particularly suitable in the usual position of delay, at the perineum, more especially when the legs are extended, and greatly preferable in that position to any attempt to pass the hand up to flex the leg. During the year forceps were applied to the breech on five occasions with most satisfactory results. In discussing "contracted pelvis," it is stated that almost every primiparous patient is given a trial of labour up to rupture of the membranes before deciding on delivery by section. Internal pelvimetry was only done once in the year as dependence was placed far more upon the application of the head to the pelvic brim, as made out under anaesthesia, and by noting the progress of labour than on the actual dimensions of the pelvis. It is interesting to note that pubiotomy was only done in one instance. Cæsarean section, however, was performed on 19 occasions; there was no maternal mortality, but five cases were morbid and two infants died. The classical method was followed with the modification that the abdominal incision was begun below the umbilicus, the uterine incision being correspondingly low, generally encroaching for an inch or more on the lower uterine segment. During the year nine cases of eclampsia occurred; these were treated by the routine method of the hospital, morphia only being given if the patient was restless in labour or when returning to consciousness; the maternal mortality was nil but four infants were born dead. Of the 1703 cases confined within the hospital 102 were morbid according to the B.M.A. standard, giving a percentage morbidity of 5.9. There were ten maternal deaths, and 7.9 per cent. of the infants were either born dead or failed to survive the first week. Included amongst the maternal deaths were three cases of rupture of the uterus, one full-term

¹ Constable and Co., 10-12, Orange-street, London, W.C. 2.

¹ THE LANCET Special Supplement, Modern Methods in Abnormal and Difficult Labour, No. 1, p. 26.

ectopic which died just after a laparotomy, and four cases of acute sepsis. There was also one case of concealed (and revealed) accidental hæmorrhage, associated with pre-eclamptic symptoms and marked albuminuria. This case was treated on conservative lines. At the necropsy hæmorrhages were found under the peritoneum and broad ligaments and the whole of the uterine wall was infiltrated with extravasated blood. There were well-marked degenerative changes in both the liver and the kidneys. In the extern maternity 2001 patients were attended in their confinements, 210 of these being abortions or miscarriages under the twenty-eighth week. There were 11 maternal deaths, and 3.1 per cent. of the infants were either born dead or failed to survive the first week. Amongst the maternal deaths there was one case of post-partum hæmorrhage, one of rupture of the uterus, and one of placenta prævia. During this year 270 patients were admitted for antenatal investigation and treatment and 407 cases were received into the gynæcological wards. Of the latter 329 were operated upon with a mortality of less than 1 per cent. The last 20 pages of the report are allocated to an excellent set of tables giving a statistical synopsis of the various cases met with. Although this statistical enumeration is not as complete as certain of the tables given in some other maternity hospital reports, the deficiency is more than made good by Dr. FitzGibbon's very full opening summary. He and his colleagues at the Rotunda are to be congratulated on an excellent year's work.

PLEURAL EMPYEMA.

THE threatened advent of an early winter, with its attendant visitation of pulmonary infections, brings the subject of empyema once more to a prominent position amongst the anxieties of our readers. So long as such epidemics persist this dangerous complication will continue to take its toll amongst patients who have successfully withstood the first shock of an attack of pneumonia. Difficulty of diagnosis is the factor which perhaps makes empyema most dangerous, and in this connexion the observations of a physician of long experience are always valuable. Such are to be found in an article recently published by Dr. F. J. O'Donnell,¹ who epitomises the experience of many years in an essay dealing with 20 recent cases of pleural empyema. Concerning the diagnosis the writer lays particular stress on four points: the persistence of marked debility, the early onset of facial pallor, an increase in the pulse-rate, and a demonstrable leucocytosis. Irregular pyrexia is almost invariably present, but Dr. O'Donnell finds this to be less constant than the increased frequency of the pulse, and it is worthy of note that fever occurring only for brief periods daily may far more easily escape observation than a rapid pulse, which can be detected at all hours. As to the physical signs, difficulty is experienced in probably the majority of all cases, for though a large collection of fluid at the base of one lung gives characteristic signs, the presence of a small collection of pus in an abnormal situation is not only confusing because of its position, but is often accompanied by the breath-sounds suggestive of consolidation of the lung. The rule adopted by Dr. O'Donnell is "to percuss the chest with a view to finding any area possessing the characteristic flat note suggestive of underlying fluid, and, if found, to explore that area regardless of the nature of the breath-sounds, if any, present there." "In doubtful cases," wrote Locke, "needle the chest early and often," and it may be said that one of the cardinal characteristics of the sound practitioner is that he does not allow the reluctance of the patient or his friends to deter him from insisting on the use of the exploring syringe in every uncertain case. Amongst the infrequent causes of difficulty in diagnosis are abscess of the lung and liver abscess rising to a high level; the discovery of pus in such conditions is still of great importance though the

treatment is not necessarily the same. As to the treatment of pleural empyema, Dr. O'Donnell shares the caution of all experienced physicians and prefers to aspirate during the more acute phases of the disease, reserving resection for a later period. He finds that children withstand operation under local anaesthesia particularly well, and he urges the importance of open-air treatment in all severe cases during the period following drainage.

MEDICAL DEFENCE.

THERE are forms of insurance which hold out such compensations for misfortune as to make disasters almost desirable; there are others, of a negative sort, which offer as their greatest inducement the reflection that things might have been very much worse. Few people feel actual pleasure in paying rates towards the upkeep of the police force which, though it may save them from the worst features of burglary, is unlikely to distribute bonuses to its supporters; and the same reluctance is manifest in paying subscriptions to medical defence societies which are merely protective in function. The Council of the Medical Defence Union, which has just published its annual report,¹ welcomes 1118 recruits to its membership during the past year—the membership is now 12,617—but speaks regretfully of this reluctance of medical practitioners to avail themselves of its services. The Union can, however, find little else to deplore in its present position, for it was never so thriving before. Its amenities have also increased. Following the case of *Harnett v. Bond and Adam*, it has been decided to offer unlimited indemnity to members for any damages sustained in a case undertaken by the Union. The Union is enabled to propose these terms by an arrangement with an insurance company by which any excess charges over 25 per cent. of the Union's annual income are borne by the company. The premium for this indemnity insurance amounted to £3377 last year; but the assets of the Union are now nearly £19,000, and this sum is so large that from January next the Union will only insure for charges in excess of 50 per cent. of the income, and the premium will presumably be smaller. This unlimited protection of members in cases which the Union feels it right to take up is offered in return for the small subscription of £1 per year, although the cost of defence last year was in one case as much as £787. Ninety-seven cases were referred to the solicitors, and ten of these were withdrawn soon after the Union agreed to defend them. Only one case was lost and here the damages were greatly reduced. In seven the Union defended its members before the General Medical Council, and in none of these was a name removed from the Register; but the Union finds a difficulty in that the Council's methods are not in accordance with legal procedure. The Council, however, does not pretend to prosecute under criminal law; it tries to discover whether conduct imputed to a medical man infringes the standard which it is the duty of the Council to maintain for registered doctors. Among other matters to which the report draws attention are the services of the general secretary of the Union in adjusting difficulties between medical men; the danger of granting interviews to dissatisfied patients, who may afterwards misrepresent the conversations; the desirability of putting the cases before the Union before taking steps which it may be unable to authorise; the inadvisability of criticism by one doctor of another; and the unwisdom of settling disputes privately rather than facing publicity. It also mentions the fact that the Lunacy Laws only require the exercise in good faith of reasonable care, in contrast to Common Law, which insists in addition on reasonable skill. In the course of its report the Union discusses its relation to the British Medical Association's scheme of defence, and denies that the existing defence societies

¹ Medical Press and Circular, August 19th.

¹ Report and Statement of Accounts of Medical Defence Union, Ltd. 1925.

"have been given every opportunity of entering into cooperation," although there have been suggestions that members of the Association should receive favourable terms from the societies. In his special report the Union's solicitor says: "The practice of the profession of medicine undoubtedly entails considerable risk of litigation, as in no other profession is the personal element so predominant and the expectation and ignorance of the public so profound." At a time when challenge of professional conduct is increasingly frequent personal insurance against such risks is practically indispensable, and a recent case has made it clear that in the opinion of the profession at large an unprotected colleague who suffers at the hands of the public has only himself to blame.

FUNGI.

THE great division of flowerless and chlorophyll-free plants known as fungi represent a somewhat neglected source both of food and drugs, for in this country it has been estimated that there are at least 200 edible forms of fungi, and this is but a small proportion of the total species of these plants, of which there are over 5000 in Great Britain. Certain of the species represent a danger to our existing food-supply; the parasites on wheat and on potato plants have of recent years been the object of study by scientific agriculturists. The chief edible species is the mushroom proper, *Agaricus campestris*, and other fungi which are safe for eating purposes and not likely to be confused with poisonous varieties are the parasol mushroom, the inkcap, the beefsteak fungus, and the hedgehog mushroom. A fungus growing on the elder, *Fungus sambuci*, has been used as a local application in conjunctivitis; the puff-ball has a reputation in country districts for arresting hæmorrhage, and a 25 per cent. tincture is sometimes used as a nervous sedative; preparations from certain members of the species of *Polyporus* in the form of agaric acid and its derivatives are sometimes employed in the belief that they check profuse sweating; but ergot alone represents these plants in the Pharmacopœia. In ancient times the eating of fungi was a common practice. The Romans especially favoured the *boleti*, while Celsus has allusions to the use of certain edible varieties. Throughout Europe and in the East fungi are much more widely used as food than in Great Britain, and with the object of remedying this neglect Mrs. Grieve has produced a little book on "Fungi as Food and in Medicine" (price 1s. 6d. post free from the author, Whins' Cottage, Chalfont St. Peter, Bucks). She first deals with the methods of discriminating between edible and poisonous fungi, and it seems that certain of the traditional ideas with regard to "mushrooms" and "toadstools" are liable to lead to dangerous results, for it must be admitted that the average city dweller is very much at the mercy of vaguely remembered information, usually culled from the "odds and ends" column of some domestic journal. They do these things better in France, however, where the préfecture de police has established a centre of inspection for mushrooms at the "Halles" of Paris. Not only is every consignment of mushrooms entering this market inspected and passed before being put up for sale, but Parisians returning from an afternoon's excursion in the country may have their gatherings of fungi classified by the inspector free of charge. The British mushroom gatherer must acquire for himself a good working knowledge of the appearance of the edible varieties to be really safe, but generally speaking, fungi with evil smells or which turn a deep blue or greenish on being cut or bruised, or with a bitter taste, or which exude a milky juice should be avoided, and it is also important that fungi should be cooked and eaten while fresh. Mrs. Grieve goes on to describe the botanical features of the principal fungi, and follows her description of the plants with either a list of tasty recipes or poisonous symptoms according to their edible properties. The popular names of many of the fungi

are in themselves attractive; "rough-legged boletus," "Jew's ear," "tinder bracket," "horn of plenty," are some examples, while among the recipes "procera pie" and "deliciosus pie" (from the "milky orange mushroom") look as if they deserved greater popularity. Truffles are more used in France and Italy than in this country mainly because the French truffle has a superior flavour to that of the English variety, and those sold over here being mostly imported and far from fresh give only a faint idea of the true truffle flavour. The fungus season begins at the end of April with the appearance of St. George's mushroom, and throughout the year until the end of October various varieties may be gathered. A most useful addition to our food resources in this country seems to be almost entirely neglected, and medicinal properties attributed by tradition to certain species of fungi may possibly represent an untapped source of therapeutic virtue.

PNEUMOCOCCUS IMMUNITY.

RESEARCH on pneumonia, which has been so well carried out by American workers during the last few years, has recently been advanced a further stage by the publication of a monograph on pneumococcus immunity¹ by R. L. Cecil, G. I. Steffen, H. S. Baldwin, and Dorothy R. Rhoades. The first part of the report consists of experiments by Dr. Cecil and Dr. Steffen with a view to producing active immunisation of monkeys against pneumococcal pneumonia. Intratracheal injections of monkeys with three doses of pneumococcus vaccine rendered the animals immune, in the majority of cases, to subsequent injection with pneumococci of homologous type, but administration of the vaccine by means of a spray did not produce so satisfactory a resistance. Little or no protective substance against the pneumococcus could be detected in the blood serum of the animals vaccinated by intratracheal injection, the immunity apparently being rather cellular than humoral. Experiments were also made by the same authors to demonstrate the effect of treatment of experimental pneumonia in monkeys with pneumococcus antibody solution prepared by the method of Huntoon. This antibody solution proved to be effective when used as a curative agent intravenously in monkeys injected with Type I. pneumococcus, less so with Type II., and ineffective with Type III., and with the one strain of Group IV. tested. Pneumococcus antibody solution was also effective in the treatment of Type I. pneumonia when injected subcutaneously. The report further contains a record of some investigations made by Dr. Rhoades on the fate of pneumococcus protective bodies when injected into normal animals and man. For this purpose two methods of obtaining the protective substance were employed—viz., Huntoon's and Felton's—both of which consist in separating out the globulin fraction from antipneumococcus serum. When solutions of this antibody are injected intravenously into the normal rabbit or man, protective substances against Type I. pneumococcus are demonstrable in the peripheral blood immediately after the injection and for a short period following; when animals were injected intraperitoneally, similar results were obtained, but when the subcutaneous route was used the appearance of protective substance was more variable. No protective substances could be elicited by the administration of these antibody solutions by trachea, mouth, or rectum. Finally, Dr. Baldwin and Dr. Rhoades report on bacteriæmia in pneumonia and its relation to the crisis. One hundred and seven cases were investigated from the wards of Bellevue Hospital, New York. The tabulated results show that with all types of pneumococcus the death-rate is much higher in cases with positive blood cultures than in cases with sterile blood. They find that pneumococci and protective antibodies rarely appear simultaneously

¹ Studies on Pneumococcus Immunity, IV. to VII., Bulletin No. 141, Hygienic Laboratory, Treasury Department, United States Public Health Service, Washington, 1925.

in peripheral blood. The same workers record work done on the use of ethylhydrocuprein in lobar pneumonia. They write guardedly of their results, but consider that there is some evidence of bactericidal effect.

TUBERCULOSIS IN THE ITALIAN NAVY.

Surgeon-General Filippo Rho, formerly Medical Director-General of the Italian Navy, and a leading authority on naval hygiene, discusses, in a paper reproduced in the *Military Surgeon* for July, the question of tuberculosis in the Italian Navy, in which service there are always more cases than in the Italian Army, the experience here being also that of France. In Surgeon-General Rho's view the chief factors accounting for the discrepancy are infection and healthy carriers, and neither predisposition nor the often-quoted hard work and exposure; while he is confirmed in this, his long-held opinion, by the experiences of the war, which did not increase the incidence of tubercle among the soldiers. For seven years he was medical officer to the Naval Academy at Leghorn and in that time saw only two cases. But in 1919 a case appeared, followed during the same year by six others, always in the same class and dormitory, though each was promptly isolated as it appeared. There must, he thinks, have been a healthy carrier, and we may suggest that an attendant was perhaps the peccant subject. Many appear to hold that the tuberculous are more likely to recover from consumption on board a ship than on shore, but this is a mistake, at any rate as regards men-of-war, as the Italian figures show. The morbidity from tubercle in 1893-97 in the Italian Army was 1.9, and in the Navy 2.6 per mille—surely called "percentages" in error. But the liability is not uniform for all men in the naval service. The liability of sailors, in 1893-97, was 1.6; that of writers, firemen, and attendants on the sick was between 3.2 and 3.5, or about twice as much. Small cubic space increases the incidence of tuberculosis, the narrow environment being more favourable for the growth of the tubercle bacillus. Surgeon-General Rho hopes much from the new copper compounds, double cyanides, which have shown good results in Japan and Italy, and not only against tubercle, but against leprosy, in the hands of Matta and Devoto, at Cagliari. His paper is worth close consideration.

CHRONIC PEPTIC ULCER IN CHILDREN.

IN a recent thesis for the degree of Master of Science in Surgery at the University of Minnesota, Dr. Oscar S. Proctor¹ discusses the subject of chronic peptic ulcer in children with a review of the literature and a record of three hitherto unpublished cases observed at the Mayo Clinic. Study of the literature showed that there were only 19 undoubted cases and two which were questionable. The patients included in this series were aged 14 years and under. The cause of chronic peptic ulcer in children is probably the same as in the adult. Two-thirds of the recorded cases were in females. The situation of nearly all the gastric ulcers was on the lesser curvature at or near the pylorus as in the adult. Approximately one-third of the ulcers were associated with definite stenosis of the pylorus. There was no indication that any of the gastric ulcers became malignant during childhood. The onset may be sudden with hæmorrhage or perforation, but this is very exceptional, and there is usually a history of gastric disturbance extending over months or years. The symptoms may be mild and attract little attention, consisting in pallor, anorexia, loss of weight, and vague abdominal pain, but as a rule they are very definite and sometimes severe. Epigastric distress or pain of varying degree is present in practically all cases, lasting from a very short period to several hours. Nausea and vomiting are present in most cases. Constipation is the rule and is often obstinate. Retarded develop-

ment is often apparent and may sometimes amount to complete cessation of growth. The figures are, of course, too small to draw exact deductions, but bleeding was present to some extent in about 40 per cent. of the cases. Perforation occurred in about 25 per cent. General peritonitis in such cases was almost always present, and the mortality has been about 50 per cent. As regards diagnosis, chronic or recurrent dyspepsia in a child should suggest the possibility of peptic ulcer, especially if the growth is retarded or if the child is under weight or pale. Hyperchlorhydria is usually absent; when present it may be helpful in diagnosis. Blood may be found in the gastric contents or in the stools, especially on repeated examination. X rays are of great assistance in diagnosis, as was exemplified in two of the writer's cases. Unless there are definite contra-indications such as marked pyloric stenosis, repeated hæmorrhage, or perforation, medical treatment should always have a thorough trial, and if it fails the simplest operations are best, such as pyloroplasty or gastro-enterostomy.

THE LATE DR. LOUIS STARR.

Dr. Louis Starr, who died recently at Dinard at the age of 76, was one of the best known authorities in the United States upon the diseases of children. Born in Philadelphia, he graduated at his native University in 1871, and in the famous American city he conducted for many years one of the largest practices in the world in pediatrics, writing also widely on his specialty as well as editing the works of others. Since his retirement from practice Dr. Starr has been living at Dinard, and some of our readers may have seen his delightful etchings illustrating scenes in the immediate neighbourhood, especially in Dinan. An old friend writes: "Dr. Louis Starr's health had for some years been precarious, and the loss in the war of his only son remained an abiding source of grief to him, although those who visited him at his beautiful villa will remember that no word of complaint either of his grief or of his physical pain ever passed his lips." We tender our sympathies to his widow and devoted companion.

WE regret to record the death of Dr. James William Russell, joint professor of medicine at Birmingham University, on Sept. 20th, after a short illness, in his sixty-third year.

THE King has granted a charter to the Medico-Psychological Association of Great Britain and Ireland, which will henceforth be entitled to the prefix "Royal."

THE annual meeting of the Fellows and Members of the Royal College of Surgeons of England, which takes place on Nov. 19th, will be an occasion of interest, as the Council of the College, we are informed, has decided to lay before the meeting the exact terms of the petition for a proposed new charter, an interesting point in which is the suggested admission of women Fellows on the same status as men Fellows.

THE University Court of St. Andrews University has appointed David Rutherford Dow, M.D., D.P.H. St. And., of Crail, Fife, to the Chair of Anatomy in University College, Dundee, rendered vacant by the retirement of Principal J. Y. Mackay. Since 1913 Prof. Dow has been lecturer in regional anatomy at the United College, St. Andrews, and assistant successively to Profs. J. Musgrove and D. Waterston. He has published several papers on research work in anatomy.

INFANT CARE.—A series of elementary lectures on infant care for creche nurses and probationers will be given by Dr. Stella Churchill at Carnegie House, 117, Piccadilly, W. 1, under the auspices of the National Association for the Prevention of Infant Mortality and the National Society of Day Nurseries, on Thursday evenings from Oct. 15th to Dec. 17th. Full particulars may be obtained from the secretaries of either of the above societies at Carnegie House.

¹ Surgery, Gynecology, and Obstetrics, July, 1925.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXL.—THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

PART II.*—THE OPERATION AND ITS DANGERS.

THE surgeon who is practised in operating upon patients with Graves's disease can judge from his experience how much should be done at one operation in each individual case. The same surgeon will, in one case, simply ligature and divide an artery; in another he will remove one lobe and the isthmus; in a third he will remove one lobe, the isthmus, and from half to two-thirds of the second lobe. A surgeon who is not practised will begin by ligaturing one artery and dividing it. He will do this for several reasons. It tests the patient's reaction to operation by something smaller than the extirpation of a lobe, and the reaction is, to some extent, an unknown quantity in Graves's disease. It will also temporarily improve the patient's condition, so that a bigger operation can be undertaken later with more safety. An operator unpractised in these cases may kill a patient by mere length of time taken, together with the unavoidable handling and the hæmorrhage, if he attempts too much at the first operation. But no one should operate upon a case of Graves's disease at all unless he is prepared to do ultimately all that is necessary to cure the patient. To remove one lobe is comparatively easy. To slice through the second lobe may present many difficulties; but to do the former only and to leave the patient at that stage is to bring into disrepute the operation for the cure of exophthalmic goitre.⁷

Steps of the Operation.

The steps of the operation may be briefly recapitulated.⁸ A "collar" incision is made following Kocher's plan. This incision is always adhered to no matter how large the goitre. The flaps, including the platysma, can be dissected up and down sufficiently to give good access, whether the lobe is approached subsequently through the mid-line, or by an oblique division of fascia in front of the sterno-mastoid. My own plan after the reflection of the flaps is to make a stab through the lower flap for subsequent insertion of a drainage-tube. The infrahyoid muscles and fascia are separated in the mid-line; if this is carried out from the larynx to the sternum the muscles can be retracted sufficiently for the enucleation of almost any lobe without lateral division of the muscles. Nevertheless, if the patient is very ill, or the lobe is big, division of these muscles will permit of enucleation with less manipulation. The superior vessels are clamped in two places and divided; these vessels should never be ligatured in continuity, for the upper pole is drawn down so far that any simple ligature may easily slip. Enucleation is carried out by peeling back the fascia from the lateral aspect of the lobe with plain forceps, while the lobe is gently rotated on its longitudinal axis towards the other side. It is wise to leave a thin shaving of thyroid overlying the region of the recurrent laryngeal nerve so that this may be protected. I believe that more damage is done by stretching the nerve in rough manipulation, or by infiltration following the damage to the surrounding structures, than by actual cutting it across or catching it in forceps. The latter may occur unless the surgeon keeps very accurately to the right plane, and unless hæmostasis is meticulously carried out as the operation progresses. The isthmus should be removed with the first lobe unless the patient is too ill, as this facilitates the second operation.

Otherwise the isthmus becomes buried in scar tissue, and its subsequent removal is accompanied by much bleeding and consequent blurring of the field. On the other hand, if it is left at the first operation, and not completely removed at the second, so much of the gland remains that the patient does not receive the maximum benefit from the operation.

The second lobe will probably be dealt with some months later. The original incision is opened, the flaps are reflected as before, but the vertical incision through the deep fascia and infrahyoid muscles will be made laterally, and not in the mid-line, in order to approach the lobe at a place free from the scar tissue of the first operation. The whole field must be clearly defined before the lobe is cut into. Enucleation will be commenced at the lower pole for several reasons; it is the larger pole and it is easily rotated forward on its attachment to the trachea by the scar tissue of the previous operation. Therefore its resection can be commenced by cutting into it from behind, and a large part of the lobe removed while the upper pole with its blood-supply is undisturbed. The procedure is as follows: a row of pressure forceps are placed on the capsule of the lobe, the lower ones being behind the lower pole, the remainder in a line approaching the lateral surface in front of the region of the recurrent laryngeal nerve and gradually coming forward on to the anterior surface as the upper pole is approached. These forceps grip vessels and arteries in the capsule and act as guy-ropes, so that the bleeding from the cut surface is under control until it is dealt with. Hæmostasis must be absolutely complete, and I believe that fine silk (or thread) is the only safe ligature for this reason—catgut loosens too readily through movements of the larynx and trachea in swallowing or coughing, and late hæmorrhage is a very serious matter.

Drainage at both operations is provided for by a split drainage-tube passed through the stab down to the bed of the thyroid. The infrahyoid muscles and fascia are brought together above this, the flaps of the collar incision are united by buried catgut sutures, which pick up the platysma, and the skin is closed by interrupted horse-hair sutures. These sutures and tube are removed in 48 hours, the flaps being held in position by the deep catgut sutures.

Dangers.

There are dangers peculiar to operation on patients suffering from this disease, and these must be given due consideration. In the first place, the selection of the case is important. Patients are not operated upon unless they are ill enough to warrant it; on the other hand, some are too ill. To operate upon a patient with increasing pulse-rate, high basal metabolic rate, mental agitation and emaciation is to invite disaster, and yet patients and friends, when they realise that ground is being lost, will often plead for operation.

Anæsthesia has some dangers. The heart is already suffering from intoxication, so that its margin of safety is a narrow one. Chloroform is absolutely contra-indicated. A skilled anæsthetist may give it with comparative safety, but many lives have undoubtedly been lost through it. If the surgeon has the complete confidence of the patient, local anæsthesia, preceded by omnopon $\frac{1}{2}$ gr. and scopolamine 1/150 gr., is ideal; but to an anxious patient general anæsthesia should be given. I prefer ether administered by an endotracheal tube, but the method may be left to a capable anæsthetist who appreciates the conditions, and can manage his apparatus so that it does not hamper the surgeon. Ether should be preceded by a hypodermic injection of atropine to lessen secretion. Waiting in the anæsthetic room should be avoided.

While there should be no undue haste, a prolonged operation and the hæmorrhage associated with it definitely increases the risk. As Sir Berkeley Moynihan has so aptly pointed out in reference to gastric surgery, speed should be attained not through hurry, but through the precision which comes with practice.

* Part I. appeared in this series in THE LANCET last week.

⁷ Dunhill, T. P.: THE LANCET, 1917, ii., 883.

⁸ Same author: Brit. Jour. Surg., 1919, vii., No. 26, p. 195.

Two dangers associated with technique are injury to one or both recurrent laryngeal nerves, and to the parathyroid glands. The former of these is much more common than is usually recognised. If one alone is injured functional recovery of voice is good. If there is delay in this it has been demonstrated that re-educational methods rapidly improve the patients' comfort (Cortlandt MacMahon). If both nerves are injured the last state of the patient is worse than the first.

A danger not sufficiently recognised is that of slow hæmorrhage occurring beneath the deep fascia and the infrahyoid muscles after the patient has returned to bed. This may happen either through incomplete hæmostasis during the operation or afterwards through movements of the larynx and trachea in coughing or vomiting, which may dislodge one of the numerous ligatures. The danger is not from loss of blood, but from increasing pressure on the trachea as the blood collects in the cavity between the vertebræ and deep fascia. The small drainage-tube soon becomes blocked with clot and fails to relieve the pressure.

Results of Operation.

The risks may appear to be so many that the practitioner may wonder if operation should be entertained. If the right time is chosen, due precautions observed, and the operation performed with precision, the results are striking, and the relief to the patient very great. There are those who believe that the signs of exophthalmic goitre are only the manifestation of general endocrine disturbance, but the result of the operation is so obvious that we are compelled to believe that whatever the primary cause of the disease may be the immediate seat of the evils which make the patient's life so unhappy is the disturbed thyroid gland. After operation the pulse-rate drops quickly, the skin becomes cool, the mental agitation subsides, there is always some recession of the eyeballs, and the feeling of strain at the back of the eyes disappears. If amenorrhœa has been present the periods become regular.

It is known that in the later stages of thyrotoxic disease, when cardiac compensation has been lost, auricular fibrillation not infrequently results. It has been shown recently that after a sufficient removal of pathological thyroid gland in this condition the auricular fibrillation disappears spontaneously and the heart rhythm becomes normal in many cases. In those patients in whom the pulse does not return to normal rhythm after partial thyroidectomy alone, it can be rendered normal by the administration of quinidine, and will, in most instances remain so; whereas without operation normal rhythm cannot be maintained by the use of quinidine alone.^{9 10}

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⁹ Fraser, Prof. F. R.: *Quart. Jour. Med.*, 1924, No. 68, xvii.
¹⁰ Dunhill, T. P.: *Brit. Med. Jour.*, Oct. 4th, 1924.

A CONFERENCE ON LIBRARIES.—A conference is being held over the present week-end (Sept. 25th–28th) at Balliol College, Oxford, under the auspices of the Association of Special Libraries and Information Bureaux. The Association exists to facilitate the use and coördination of all sources of information for scientific, technical, commercial, and public purposes. Sessions will be devoted to the present position of the special library movement; to informational work in politics, business, science, engineering, transport, medicine, and patents; and to public and university libraries, &c. A large mass of printed information lies idle through lack of coördination, and this fact naturally makes many and varied bodies interested in the conference. A number of Government departments will be represented, and also learned societies, research associations, the political parties, and many other organisations. The Minister of Labour (Sir A. Steel-Maitland) is opening the proceedings, and a long list of speakers includes Sir Horace Plunkett, Prof. Gilbert Murray, Prof. A. F. Pollard, and Dr. Chalmers Mitchell. The address of the Association is 38, Bloomsbury-square, London, W.C. 1.

Special Articles.

AMERICAN HOSPITALS.

BY LIONEL G. PEARSON.

(Adams, Holden & Pearson, Architects, Knightsbridge.)

AMERICA is a good country to visit—people are extremely friendly, hospitable, and ready to show everything to the visitor from across the Atlantic, and anyone who wishes to study their buildings is sure of a very pleasant experience.

Of course the ground to be covered is immense, and the amount of hospital building so great that it is somewhat difficult to make a choice of what to see, especially as authorities have a way of differing as to the relative merits of various cities and buildings. New York City makes the best starting-point without any doubt, for though the Americans deny that it is a typically American city, the fact remains that the best examples of recent architecture are to be found there, whether it is a question of banks, railway depôts, hotels, apartment houses, or hospitals. The pace at which New York (or other cities to a lesser degree) is being rebuilt is astonishing, and it is this extraordinary building activity, the result of commercial prosperity, which makes America at the present moment the most exciting country in the world architecturally. After New York the big new cities of the Middle West probably contain the most interesting examples of recent buildings. California, which has developed on rather different lines from the rest of the country, was too far off to visit in the time at my disposal.

One of the first things that strikes a visitor from England is the importance of mechanical means of heating and ventilation in America. In summer the electric fans and cooled air, in winter the use of radiator and heated air, have had the result that even in hospitals the open window which we consider the first consideration of health is not quite so much the matter of course over there.

The Pavilion Type Obsolete in America.

In any case the pavilion type of hospital with the cross-ventilated ward of between 20 and 30 beds no longer meets present-day requirements in America. Even where the large wards exist, the tendency now is to divide these with glazed screens so that cases can be classified and segregated. The Vanderbilt University Hospital at Nashville, Tennessee, is typical of present-day requirements. (Fig. 1.) Here a ward unit of 30 beds is made up as follows: open ward of 16 beds divided into four cubicles of four beds each, and the remaining 14 beds into four-bed, two-bed, and single bedrooms. Dr. Winford Smith, of the Johns Hopkins Medical School, Baltimore, Maryland, who acted as consultant for this scheme, advocates the use of wards 40 ft. wide, so that the patients' beds may be at right angles to the window in order to avoid light in the patients' eyes, and this width also is useful in planning the lower floors for other departments.

Provision of Private Rooms.

There are, of course, hospitals such as the Henry Ford Hospital, Detroit, Michigan (400 beds) (Fig. 2), and the Fifth Avenue Hospital, New York City (420 beds) (Fig. 3)—the latter being probably the best planned and equipped city hospital in the world at the present time—which consist entirely of private rooms, but these are still the exceptions, and it is more usual for a hospital to erect a pavilion of private rooms for paying patients. A very good example of this is to be seen at Mount Sinai Hospital, New York City, which was erected under Dr. Goldwater's direction for 131 patients, and embodies most of the best ideas of the day in this class of building. The low pavilion type of ward building is also unsuited

to the city site where the majority of hospitals are of necessity located.

Vertical Height in Relation to Concentration.

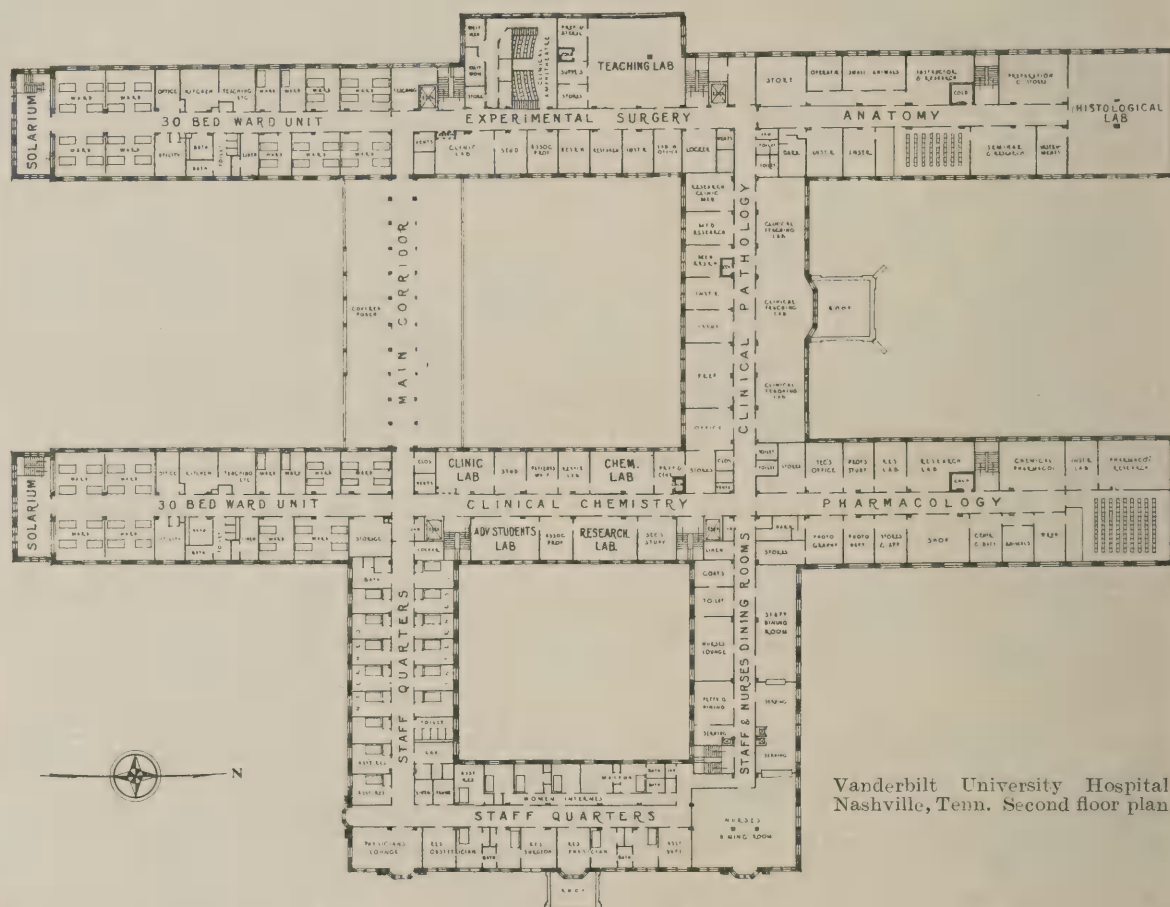
The new Columbia Presbyterian Hospital in New York City is to be 15 storeys. The Fifth Avenue Hospital, N.Y.C., is 10 storeys; St. Luke's Hospital, Chicago, 19 storeys; and even on a comparatively open site it is not uncommon to have a 6-storey building. This is not only a question of the value of the site, but also very much a question of service. The American believes very strongly in concentration, and vertical buildings are much more

system of carriers for conveying the records to various departments, such as X ray, skin, &c., on different floors of the building.

The Food Service.

The food service is usually very efficient, and as great attention is paid to diet a portion of the main kitchen is frequently separated for this purpose under a special dietitian. In the case of the larger hospitals the food is conveyed from the kitchen (which is as near as possible to the elevators) to the diet kitchens on the ward floors in electrically-heated trucks, but in the smaller hospitals where the food trays are set

FIG. 1.



Vanderbilt University Hospital, Nashville, Tenn. Second floor plan.

suitable to the elevators and shuttes and all the mechanical equipment of the present day than the spread-out horizontal type of building where the staff must walk long distances, and the plumbing, heating, refrigerating, and drainage services must be less concentrated and efficient.

The elevator plays an important part in modern American life, and in hospitals, as in other buildings, the staircase is relegated to an inferior position and used mainly for fire-escape and floor-to-floor services. The elevators must, of course, be near the main entrance hall, which is generally made as attractive as possible architecturally, and follows the lines of the hotel as far as possible. This idea is also noticeable in the waiting-room, which is invariably comfortably furnished in the style of a hotel lounge, and the private room adjoining the superintendent's office, where financial matters may be discussed without disturbance. But perhaps the most characteristically American side of the administration is the record system to which a great deal of attention is directed. A large room near the entrance is usually assigned to this department, and in the out-patients' department of the Boston City Hospital there is a Lamson

up in the main kitchen, these are conveyed to the diet kitchens in dumb-waiters (small service lifts). The main kitchen is too often in the basement, and it is questionable whether this is good for the health of the staff, however perfect the mechanical ventilation may be. The kitchen at the Peter Bent Brigham Hospital, Boston, Mass., which is on the top floor, is a pleasant contrast in this respect. In this section it may be noted that the food is stored in refrigerators, and the same applies to kitchens on the ward floors. The nurses and staff dining-rooms are frequently arranged as a cafeteria (this is a popular form of self-service restaurant throughout the States), but it is doubtful whether the tired nurse altogether appreciates this system in spite of many advantages.

Labour-saving Arrangements.

Laundry arrangements are, as one would expect, very up to date and efficient, and the system of dealing with linen and surgical dressings is thoroughly considered in the planning of the building. The linen chute is a feature of American hospitals, and consists of a circular glass-lined tube 2 ft. in diameter, with a port-hole opening on every floor and a flushing

ring at the top with drain connexion at the bottom. This is a labour-saving device much in use in hotels and private residences, but it has the objection that it may convey foul air from the disinfecting room at the bottom of the chute to the various floors. How-

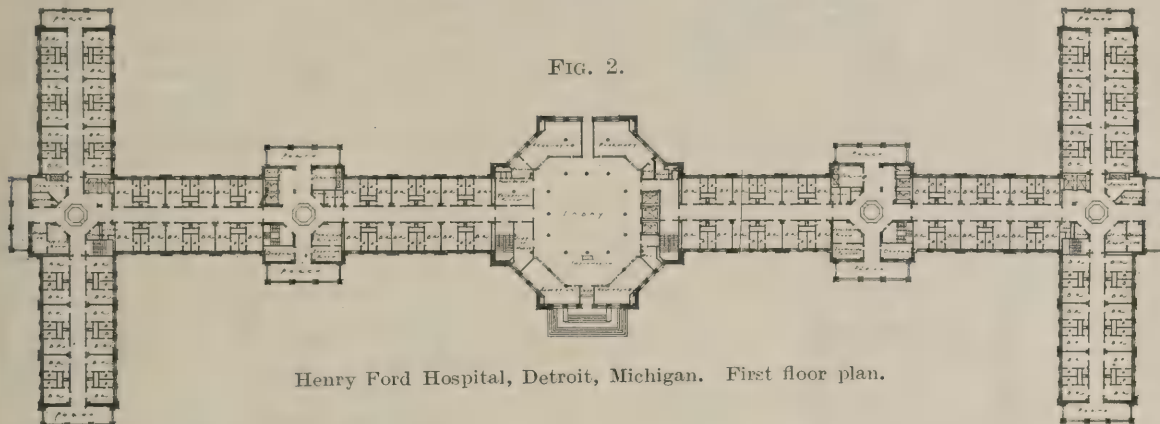
ever, there is no doubt that as far as labour-saving devices are concerned, America leads the way, though one feels that in a hospital the health of the patient is even more important than the question of service economy. The system of "signal lights," by which patients summon the nurse at night and the doctor is "warned for duty," is another device without any drawbacks.

Sanitary Arrangements.

The sanitary arrangements are fundamentally different from those in this country. The chief cause

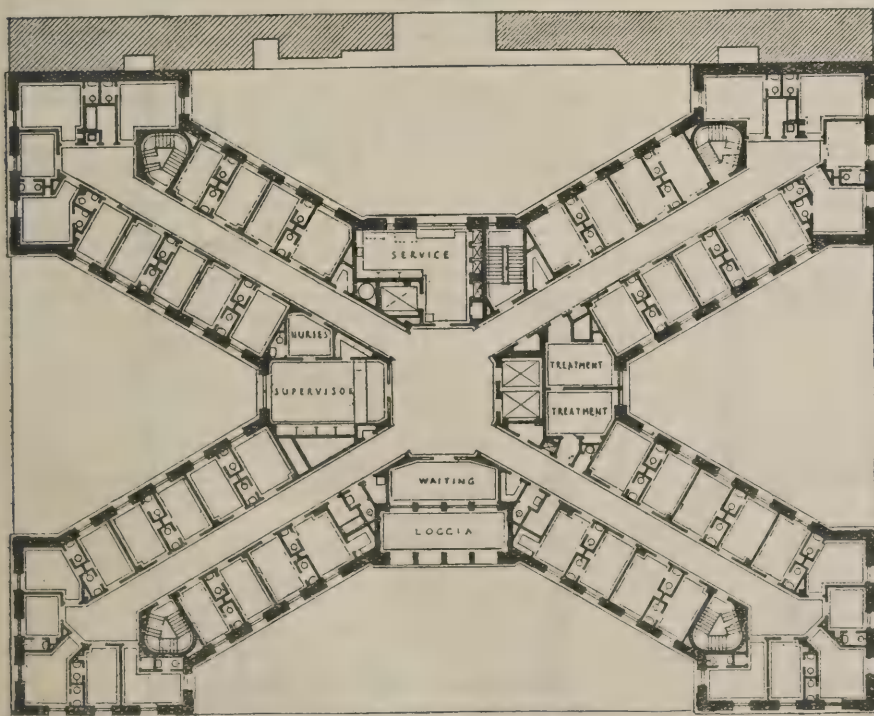
of the difference is that the soil and waste pipes, partly on account of the severe winters, are placed on the inside walls of all buildings, and it is not considered objectionable to open a toilet room direct off a bedroom and to rely on mechanical means of ventilation rather than a window direct to the open. This attitude to plumbing has profoundly influenced the planning of hospitals, where the sanitary tower with cross-ventilated lobby is almost unknown. In the case of the ordinary ward, the toilet and bathrooms open off

FIG. 2.



Henry Ford Hospital, Detroit, Michigan. First floor plan.

FIG. 3.



Fifth Avenue Hospital, New York City. Typical floor plan.

of difference is that the soil and waste pipes, partly on account of the severe winters, are placed on the inside walls of all buildings, and it is not considered objectionable to open a toilet room direct off a bedroom and to rely on mechanical means of ventilation

a room divided from the corridor by a glazed screen. The provision of scrubbing rooms, flower rooms with sinks, a laboratory for routine work, and a comfortable waiting-room, is usual on every floor.

Another fundamental difference between English and American plumbing is that in the latter case the pipes are not usually exposed on the surface of the wall or ceiling, but are "buried," in the case of the wall in a wide cavity, and in the case of the ceilings covered by a sub-ceiling. This results in a very smart appearance, especially in the case of operating theatres, and is undoubtedly excellent from the point of view of cleaning. But several medical superintendents spoke rather sadly of the results when a pipe burst, when the ceiling has to be "torn down," or the wall opened up at great expense, although this can be obviated to some extent by inspection openings at junctions, &c.

The nurses' station in the case of large wards overlooks the wards; in the case of private rooms is placed centrally either in the corridor or in

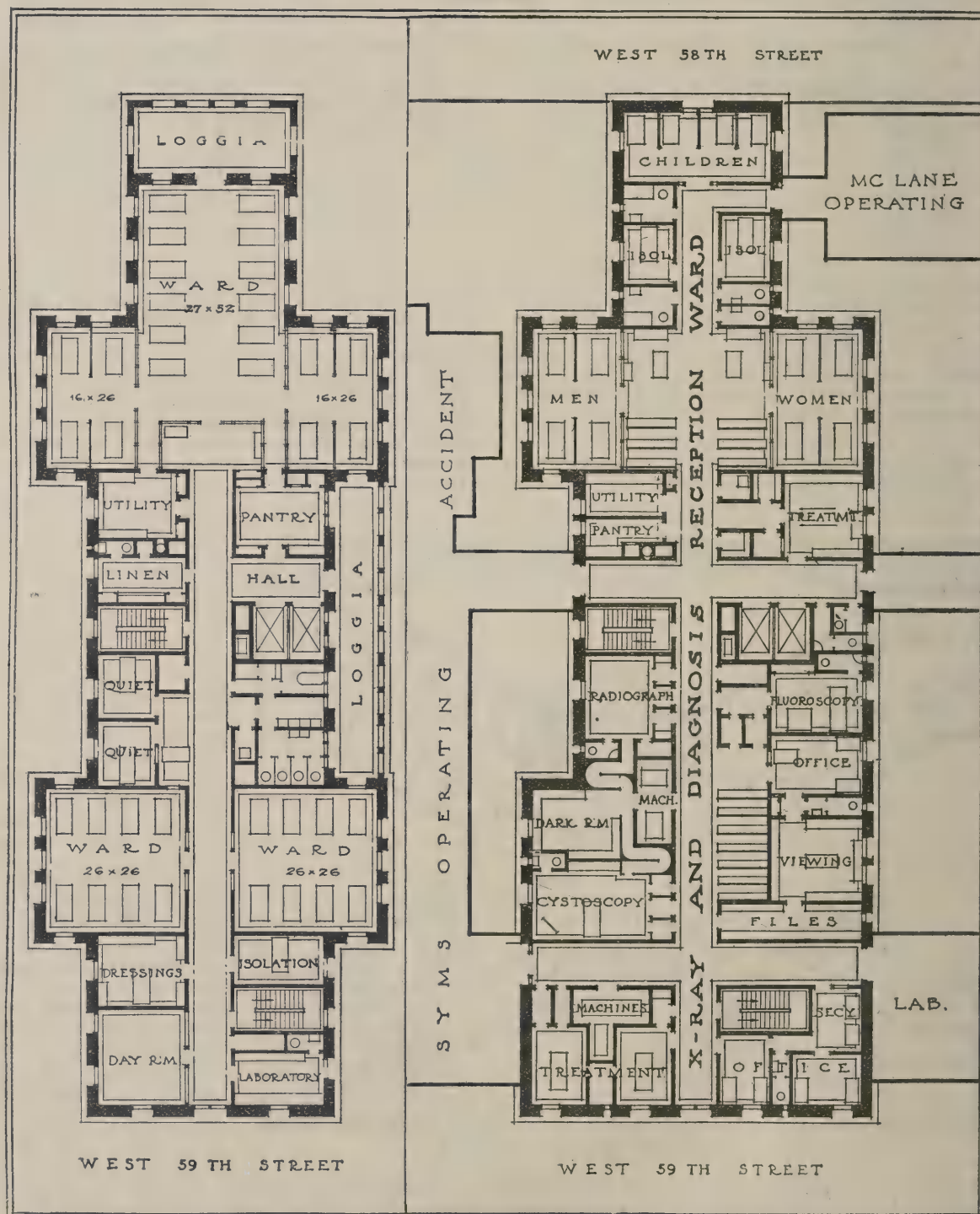
Operating Theatre.

The operating theatre suites are very much on the same lines as the English model. There is usually a sterilising room and a scrub-up room (with borrowed light) between two operating theatres, and the instrument cases are neatly arranged sunk into the wall flush. The floors and walls (up to door height) are now invariably covered with light grey or light green tiles, as this is considered more restful in the

eyes of the operator; in one instance—at the Crile Hospital, Cleveland, Ohio—the floors and walls of the operating theatres are covered with rubber tiling, but this is not considered so sanitary as the tiling or terrazzo. The window is usually double up to transom level and the air between the two windows is warmed, so that there is no draught on to operating table.

There are various types of electric light in use, such as "Scanlan-Morris Noshadowite" (eight con-

FIG. 4.



Roosevelt Hospital, New York City. New Pavilion. A, Plan of typical floor. B, Plan of first floor.

verging lights in a ring), "Frink Operating Table Reflector" (with automatic ventilation to counteract heat generated), and the "Operay-multi-beam" (adjustable light with lenses and mirrors), but the "Portable Scialitique" seems the favourite at the moment. The American surgeon appears to have little use for natural light, and operations are usually performed by artificial light. Dr. John Clark, of Philadelphia, has arranged an operating theatre at the University Hospital with a falling shutter of the shop-front type, behind which the patient is prepared, while the operator can use the front of the shutter for slides and diagrams facing the students' seats—at the time of operation the shutter is, of course, raised.

X Ray Departments.

The increasing importance of X ray work is nowhere more fully recognised than in America, where the use of X ray for diagnosis has reached such a point that in one important hospital over 75 per cent. of the patients are now X rayed. The result is that there are now many well-planned and splendidly equipped X ray departments, and one of the best of these is to be found at the Roosevelt Hospital, New York City (Fig. 4), where the architects (Messrs. York and Sawyer, who also designed the Fifth Avenue Hospital and many other well-known public buildings) worked out a plan in conjunction with Dr. Steiner. The department is situated on the ground floor near the operating block, and conveniently placed for the out-patients, and consists of a radiographic room, dark room with special light-excluding pass-boxes of a revolving type, cystoscopic room, fluoroscopic room, viewing room, with an excellent set of viewing boxes made of enamelled steel and filled with Cooper-Hewitt lights, and a room for files. The treatment rooms are in a corner of the building cut off by corridors from the rest of the department, and special precautions are taken against rays, as the whole of the walls and ceilings are treble-lined with lead, wire-mesh, and finally glazed tiles, and the floor is lead and cork.

There is another very fine X ray department at the Boston City Hospital in the New Thorndike Memorial Building. This department is on two floors—on the ground floor are waiting-rooms, radiographic rooms, viewing room, and records; in the basement are the treatment rooms (with machines enclosed in a room 6 feet wide between two treatment rooms in every case), an exceptionally fine dark room with smaller rooms for wet plates, plate loading, &c. Special attention has been paid to the ventilation, an important point, unfortunately too often overlooked with resultant damage to the health of the assistants. There is a lecture hall at the end of the corridor two floors in height for the use of the department, so that altogether this is in many ways a model of what an X ray department should be. The colour of the walls found to be most satisfactory by the X ray men is orange or buff, and several departments have plastered walls coloured to these tints, and the floors are usually tiled like an operating theatre or covered with battleship linoleum with a border and skirting of terrazzo.

Open-air Arrangements.

The exposure of patients to fresh air and the sun's rays has affected the design of American hospitals considerably. The covered-in balcony at the south end of the ward block is still a favourite arrangement, as it is in England, but there is a development of this idea which is in many ways preferable, by the provision of a loggia in a central position, as in the Fifth Avenue Hospital, where it does not shut off any light or air from the patients' rooms, or more frequently by the use of a sun-room on the top of the hospital, furnished with easy chairs and with French windows opening on to a flat roof. In the case of private pavilions, a separate small balcony is quite often allowed to each room so that the patient's bed can be partly in the open air.

American and English Hospitals Compared.

In conclusion the question might be asked, "How do American hospitals compare with English?" and

though differences of climate and custom account for many things that seem strange to us, the general impression remains that the ideals aimed at are the same in the two countries (the English hospital tradition must have had considerable influence over there), but that in some ways they have gone ahead of us. The love of system and business efficiency which is characteristic of the modern American business man (not necessarily of the Babbit type) has been applied to hospital planning with good results. The course of the patient from the time he enters the building to the time he leaves it (dead or alive) is traced just as Henry Ford traces his car production, and the same may be said of the food service, &c., and a considerable saving in running costs is effected in this way though, of course, this usually means increased capital outlay.

As to the tendency to rely more and more on mechanical contrivances there is certainly a reverse side to this, as Americans themselves realise in industry, for "the human touch," which is specially necessary in the treatment of disease, may suffer as a result. Perhaps it is lucky for us in some ways that our comparative lack of money makes us spend less on these things. Also we are more sceptical about new inventions, and not so eager to scrap old methods and adapt new ideas as the Americans. They take the risk as one of them once said to me, "of making great big mistakes sometimes."

The question of the paying patient (whose advent has resulted in the private room and individual sanitation) is partly an economical one, and we have not such a large class of comparatively well-to-do middle-class patients to draw on in this country. But in England, too, the future will see considerable developments in this direction, and in working out our own problems we can undoubtedly learn much from the study of the fine work carried out by the hospital committees, medical men, and architects in America.

INDUSTRIAL HYGIENE.

AMSTERDAM CONGRESS, SEPT. 6TH-13TH.

THE international congress held from Sept. 6th to 13th at Amsterdam and The Hague was the fourth concerned with industrial accidents and diseases. The permanent committee in recommending the series of meetings, the last of which was held at Rome in 1912, acted wisely, first in combining the two sections into one congress, and secondly, in selecting neutral, but central, territory for the representatives of nations to come together again. The countries sending official delegates were America, Australia, Austria, Belgium, Brazil, Britain, Bulgaria, Canada, Chili, Cuba, Czecho-Slovakia, Denmark, Finland, France, Germany, Holland, Hungary, Ireland, Italy, Japan, Norway, Poland, Spain, Sweden, South Africa, Switzerland, Roumania, Russia, and Turkey. The list is testimony to the spread of industrialism over the world with its post-war development in fresh centres.

Apart from official delegates many others were present whose reputations would alone have made the congress a notable gathering; among them may be mentioned Prof. B. Cuneo, France; Dr. Carozzi, International Labour Office, Geneva; Dr. L. Teleky, Vienna; Sir T. Oliver, Newcastle; Prof. F. H. Albee, U.S.A.; Prof. J. Glaister, Glasgow; Prof. L. Devoto, Italy; Dr. A. Trimble, Belfast; Prof. D. Koelsch, Germany; Mr. S. Alwyn Smith, Cardiff; Dr. W. Watkins-Pitchford, Johannesburg; Prof. E. L. Collis, University of Wales; and Prof. S. Kaplun, Russia. Great Britain was well represented, although the committee, under the presidency of Sir T. Oliver, which organised its membership and contributions had many difficulties to face and but few months to do its work; in this matter thanks are due to Dr. H. Menko, an able and indefatigable secretary, whose knowledge of Holland made him invaluable.

Holland is an entrancing and unique country to visit, which owes its very existence, lying below the sea-level, to the untiring activity of its population.

Its main industry, of course, is agriculture particularly applied to cattle and dairy produce, to market gardening and bulb-raising, but pottery is made at Delft, and diamonds are polished at Amsterdam, while Rotterdam possesses shipbuilding and docks second to none, and the Dutch glass industry flourishes. Hence those who attended the congress had opportunity of studying old problems in unfamiliar environment and of learning by inspection as well as by interchange of ideas.

The number and subject-matter of the papers contributed gave eloquent evidence of the scope of modern industrial hygiene. One criticism may be offered—the papers were too numerous and too diverse, and also too unequal in quality, to permit of adequate consideration and discussion. They numbered 147, and frequently time only allowed of their presentation at the meetings in the form of summaries too short to do them justice, particularly having regard to the diversity of languages employed.

Reference may be made to some of the more notable papers. Not the least interesting was an able résumé of the legal and ethical aspects of industrial insurance in Great Britain, prepared by Prof. Glaister, who, in concluding, stressed the need for compulsory medical examination when choosing a trade or profession—a subject which was further elaborated on the basis of German experience by Dr. W. Pryll. Dr. A. Kutschera pointed out the economic value of treatment of injuries; while Prof. Julliard summarised the different systems of dealing with financial claims for invalidity, whether by periodic payments, lump sums, or deferred claims. Sir T. Oliver in the address which we published last week related some recent achievements of industrial hygiene.

The treatment of accidental injuries, a matter of increasing importance to insurance companies, many of whom had sent their medical officers to the congress, was discussed from many aspects. Here Prof. Albee held his audience entranced with an exposition of bone-grafting by his new methods; Prof. L. Imbert made a valuable contribution on the treatment of fractures; Prof. Ch. Lenormant dealt with the treatment of wounds by suture; Dr. A. Oller described the Spanish institute where injured men are made fit to work again; Mr. Alwyn Smith pointed to the social and economic importance of dislocation of semilunar cartilages; Prof. Elsching handled the subject of industrial injuries to the eyes; and Mr. P. Mitchiner discussed injuries to the carpus and metacarpus and the value of stereoscopic X ray examination.

A link between accidents and diseases was provided by the relation between tuberculosis and occupational trauma which, Dr. F. Zollinger held, was difficult to prove satisfactorily, a view independently propounded by Prof. S. Diez, but Dr. Trimble produced evidence of a definite connexion. Closely associated in subject-matter were the papers by Prof. Collis summarising recent advances in knowledge on pneumoconioses with special reference to silicosis, and by Prof. M. Sternburg on new views of this subject, and the less definite contribution by Prof. J. G. Sleeswijk. Other papers dealt with such occupational troubles as nystagmus, dermatoses, and tar cancer. The influence of overheated and damp atmospheres was dealt with from different viewpoints by Dr. C. S. Thomson and Dr. J. Torres Fraguas, which were reinforced by Dr. H. M. Vernon's evidence that invalidity increases as the mean temperature falls below or rises above an optimum of about 62° F.

The publication of the transactions in which these and the other papers will appear in full must be awaited before the full value to experts of the fruits of the congress can be appraised. But already the social success can be acclaimed. Throughout the week the hosts of the congress were perfect; their unstinted hospitality was notable, even for Holland; their tact, amounting almost to insistence, determined that

national animosities should be suspended for one week at any rate, that national aloofness should be laid aside, and national friendships cemented. The cause of international meetings, as well as that of industrial hygiene, has thereby been placed deeply in debt to the Netherlands.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Irish Free State and the Medical Register.

It is understood that, owing to the absence on holidays of many members of the Medical Consultative Subcommittee, there has been no meeting of that body since its interview with President Cosgrave on Sept. 9th (THE LANCET, Sept. 19th, p. 621). Conversations will probably be resumed early in October, and an attempt will be made to draft a scheme satisfactory both to the Government and to the Medical Subcommittee. Last week Dr. F. C. Purser, President of the Irish Medical Association and a member of the subcommittee, made a report to the Council of the Association of the negotiations up to the present. The policy of the Association in regard to the Medical Register was laid down at the annual meeting held in June, 1924, when the hope was expressed "that no change will be made in the system of medical registration in the Irish Free State which would interfere with the right at present possessed by medical men qualified in Ireland to practise in Great Britain and the Dominions." The representatives of the Association—Dr. Purser and Senator W. O'Sullivan—were thanked for their services and requested by the Council to continue to work for the policy of the Association as laid down in the above resolution.

The Senate Elections.

At the time of writing the count of first preferences in the Senate elections is not quite complete, though one can form, from the figures published, a fair estimate of the support given to the several candidates. It is expected that the quota for election will be about 15,000, and it is not likely that anyone will reach the quota on the first count. Of the medical candidates, so far, Mr. H. L. Barniville, an outgoing Senator, has done best, and of the others Sir Edward Coey Bigger has also done well. The remaining medical candidates appear in the following order, which may, however, be altered by further counts: Sir Arthur Chance, Mr. Denis Kennedy, Dr. A. MacBride, Dr. S. P. MacEnri, Prof. E. P. McLoughlin, Mr. P. McCartan. The medical candidates have been so far more fortunate than the legal. There were only two barristers among the candidates, and neither of them appears to have much likelihood of election.

MANCHESTER: POST-GRADUATE COURSES.—Post-graduate work, except for diplomas of public health and psychology, has not developed in recent years in Manchester. There is, perhaps, some feeling that a large influx of doctors from outside into the principal hospitals might damage the sound practical training which students receive. There have, however, been at several of the hospitals many courses of afternoon lectures open to and specially prepared for practitioners in the surrounding populous district. This year lectures are announced at Ancoats Hospital and at the Royal Infirmary. At Ancoats Hospital a series of lectures will be given by Mr. E. E. Hughes and Mr. Harry Platt on urinary symptoms and the treatment of fractures respectively. At the Infirmary members of the acting honorary staff take each one lecture on various subjects in turn, and there are also lectures by Dr. A. McDougall on epilepsy, Prof. W. L. Bragg on the nature of X rays, Prof. J. S. B. Stopford on the sympathetic nervous system, and by Sir William Milligan on foreign bodies in the food and air passages. This year the Lloyd Roberts Lecture will be given at St. Mary's Hospital, Whitworth-street, on Tuesday, Nov. 17th, by Dr. T. Watts Eden, on What We Can Do for the Unborn Child. This lecture is given at St. Mary's Hospital and at the Royal Infirmary alternately.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the health statistics of one English and two Scotch cities for 1924:—

Name of city.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.	
			All causes.	Tuberculosis.	Cancer.	Resp. Diseases with influenza.	Neonatal mortality.	Infant mortality.
Sheffield . . .	525,000	18.5	11.6	1.02	1.24	2.4	44	90
Edinburgh . .	426,305	19.7	14.8	1.33	1.60	2.5	36	89
Aberdeen . . .	160,387	21.4	14.4	1.33	1.43	2.3	40	122
								Maternity mort. from childbirth.
								4.5
								6.0
								5.5

Sheffield.

Dr. Fred. E. Wynne reports as the outstanding feature of the year a very serious outbreak of encephalitis lethargica, which began towards the end of the first quarter and continued throughout the year. The incidence of the disease was heavier in Sheffield than in any other town. There were 337 notifications, in which the diagnosis was confirmed, and 40 deaths. Fifty-eight per cent. of the notifications were males, 42 per cent. were females, and 56 per cent. were under the age of 21. The after-effects of the disease have in many cases been tragic, and these after-effects are at present being investigated by the newly formed Medical Advisory Committee. The formation of this committee, say Dr. Wynne, is an event of first-rate importance to the city, mobilising, as it does, all classes of medical workers for the study of modern problems in preventive medicine. The committee will issue a detailed report dealing with possible factors in the causation and spread of the disease, and with its clinical manifestations, pathology, and after-effects.

A table deals with the prevalence of tuberculosis in the 17 towns of England and Wales having populations over 200,000, and brings out the fact that the Sheffield death-rate, both from respiratory and other forms of tuberculosis, is less than that of any other of these towns, and, in addition, that the percentage reduction in the death-rate from tuberculosis, under both headings, during the past ten years is the highest—namely, 42.6 per cent. for all forms of tuberculosis and 40 per cent. for respiratory tuberculosis. As Dr. Wynne says, these results are particularly gratifying in view of the nature of the principal industries of Sheffield. He refers to the better conditions under which various classes of grinding and abrasive industries are now carried out, and to the detection and treatment of early cases under the Silicosis Regulations as important factors in the improvement, but states that the conditions under which much of this industrial work is done are still profoundly unsatisfactory. Properly organised factories are needed to replace the dark insanitary "wheels" still in use. The work of the tuberculosis dispensary, where an enormous number of suspects and contacts are examined and supervised, is cited as perhaps the most important factor in the decline of tuberculosis in Sheffield. The King Edward VII. Sanatorium for surgical tuberculosis with its out-patient department is also responsible for the saving of many young lives and the prevention of crippledom.

Dr. Wynne states that the hospital isolation of measles and whooping-cough is more urgent than that of scarlet fever and diphtheria. Most cases of scarlet fever could be successfully treated at home and the hospital beds allocated to this disease could be usefully

devoted to measles and severe cases of whooping-cough. The death-rate from infantile diarrhoea is less than one-fifth of what it was ten years ago, and Dr. Wynne gives as the most important factors in bringing about this decline "the wide substitution of dried for so-called fresh, but highly contaminated, milk" and the educative work of the child welfare centre. He is definitely of the opinion that until methods in the milk industry have been revolutionised "liquid milk should be banished from the dietary of infants." A table is given showing that the mortality-rate at ages 1 to 5 has improved during the last 25 years just as much as the infant mortality-rate, thus disproving the suggestion that the result of the efforts made is merely to postpone the deaths of feeble and degenerate infants from the first year to a slightly later period.

Overcrowding in the city is still deplorable. The waiting-list for municipal houses became so hopelessly unwieldy that for a time it was closed. Last year 1042 new houses were certified, the largest number since 1921. The list has now been reopened, and about 4000 new applicants have been registered. Of the 1042 new houses certified 305 were erected by the corporation.

The veterinary staff found 23 cows with tuberculous udders during the year in the 2348 stalls used for milch cows within the city. As regards the country milk coming into the city by road and rail, 959 samples were examined for tuberculous infection and 72 gave a positive result. In following up these tuberculous milks 47 cows with tuberculous udders were discovered. At 29 of the country farms visited no tuberculous udders were found, but in most of these cases cows had been sold during the period between the taking of the sample and the date of inspection. The latter period was shortened in many instances when the microscopical examination of the milk gave a positive result. Thus 29 country cows were condemned on the microscopical examination of the milk alone. Of the 75 cows proved to have tuberculous udders 58 were slaughtered, but 17 were sold by the owners and lost sight of.

Edinburgh.

Dr. William Robertson points out that the figures of density-rates for particular areas will be altered by the improvement schemes which are in hand. This applies to the wards in Edinburgh and Leith respectively, in which the death-rates are highest—namely, St. Giles and North Leith. Infant mortality has always been highest in the wards where the density is greatest and the one- or two-roomed houses predominate. The future progress of these wards after the improvement schemes are completed will be watched with much interest, says Dr. Robertson. Four arc lamps have been installed at the hospital for the treatment of surgical tuberculosis, and mercury-vapour lamps have been provided for the use of the child welfare clinics. Dr. Robertson is convinced that there is a great future for artificial light treatment and proposes to ask the Health Committee to extend the employment of artificial sunlight to other institutions. He thinks it will be found especially useful for children convalescing from various infectious and non-infectious illnesses. Greater encouragement is now given to the treatment of scarlet fever in the home. The hospital report shows, however, that the type of scarlet fever has recently become more severe. Thus the hospital mortality-rate, which was 1.9 per cent. in 1922, increased to 5.2 per cent. in 1923, and was 4.2 per cent. in 1924. Among the complications occurring there was an unexpectedly fatal type of nephritis. Edinburgh was the first town in this country to attempt the immunisation of school-children from diphtheria on a large scale. Twenty-six schools were taken in hand and 3507 children immunised without a single untoward event being recorded. The scheme is to be extended to the pre-school age, the period when the incidence of diphtheria is greatest. Measles and whooping-cough became epidemic in the later months of the

year. Two fever-trained nurses were appointed to visit the homes and a large number of beds at Colinton Hospital were set aside for the reception of the more serious cases as well as of cases where the home circumstances were unsatisfactory. The tuberculosis death-rate showed a slight increase in 1924, and Dr. Robertson draws attention to the need for education in personal hygiene. For example, the citizens must be taught to appreciate that it is not so much the amount of food, but the correct selection and cooking of food that counts in building up and maintaining the body in good health and repair.

The report on the venereal diseases scheme shows that there is a progressive decrease in the percentage of patients who fail to complete their treatment. Thus in 1920 the percentage of defaulters was 40, in 1921 26, in 1922 it was 18.5, in 1923 15.6, and in 1924 11.9. Dr. David Lees, the V.D. medical officer, points out that this comparatively low percentage of 11.9 represents in the Edinburgh scheme a total of over 800 patients. The standard of cure adopted is high and many of these patients may be free from disease, but there are others who undoubtedly still have communicable disease and the problem involved requires careful consideration. Dr. Lees reports that the experiment of treating married women and children without specifically labelling them has been an unqualified success. Under this scheme 146 patients received in-patient treatment and subsequently put in 1452 attendances as out-patients. The percentage of those who failed to continue treatment was only 2, and more beds need to be allocated to this type of work. One of the drawbacks to the Edinburgh scheme is the lack of a hostel for unmarried girls who have contracted disease and lost their situations. The need for a V.D. centre in Leith has been recognised for long, but the Leith Hospital could not provide the accommodation required. Suitable premises have now been purchased quite close to the docks and the new clinic will be at work during 1925.

Dr. Robertson draws attention to the disparity between the rents at present paid by the slum-dwellers and the rentals of the cheapest of the new houses. Thus in the St. Giles Ward there are 1706 houses let at rentals of £5 to £10 per annum, while the cheapest of the new houses are rented at £12 and £15. Dr. Robertson goes on to bemoan the difficulty in convincing "many people who live in slums that a £15 house provided with such conveniences as electric light, gas boiler, hot-water system, washhouse, tub and sink, coal-cellar, drying green, and open air all round is in every possible direction worth £5 more than the dungeon-like slum devoid of almost every comfort that a human habitation should possess." There is a lack of skilled tradesmen in Edinburgh and houses have been kept waiting for plasterers. Dr. Robertson would like to see a chance given to mass production, and says, "there is surely much to be said in favour of a type of house that can be erected and made ready for habitation in six weeks time."

Progress has been made towards a cleaner milk-supply and a clean milk competition has been held. The amounts of designated milks at present sold daily in the city are as follows: Certified, 185 gallons; Grade A (tuberculin tested), 83 gallons; pasteurised, 2181 gallons, making a total of 2449 gallons. The daily consumption of undesignated milk amounts to 20,255 gallons. The cow population of the city numbers 4430, and among these the veterinary staff found 23 tuberculous udders and four cows with advanced tuberculosis. Mr. A. Gofton, the chief veterinary inspector, draws attention to one of the difficulties experienced by the owners of tubercle-free herds. If such an owner makes a purchase from any but a certified herd, he has no assurance that a cow which passes the test will also pass a second test applied after an interval of several months. The explanation is that the purchased cow may have been exposed to infection immediately before purchase and is therefore harbouring infection, which

is at too early a stage to cause a reaction to the first test, but has time to develop between the first and second test. Mr. Gofton advises that when such an owner cannot make his herd self-supporting by breeding, he should segregate all new purchases for two or three months and then re-test.

Aberdeen.

Dr. J. Parlange Kinloch explains that his 1924 report is of the nature of a five-yearly survey. The report is a document of 200 pages and deals at some length with the methods which the health department has found most useful in preventing and curing disease, and also with the impending expansion of the statutory health services. It is only possible to refer to a few of the interesting points raised in this lengthy report, which will no doubt be of great value to the members of the town council and of all the other statutory and voluntary bodies interested in the health of the city. Under the heading "typhoid fever," Dr. Kinloch tells us that Aberdeenshire experience during the past 30 years suggests that this is now almost entirely a food-borne disease, due to the infection of milk or other foods by typhoid carriers, and that diminution in the number of typhoid carriers, due to the absence of the epidemic form of the disease, explains the diminishing amount of milk infection. As regards puerperal fever, Dr. Kinloch thinks it is of the utmost importance that routine bacteriological examination of expectant mothers about the seventh month should be carried out, with a view to determining what proportion of them have streptococci in the urethra or cervix. Methods of disinfection are to be modified. More visits will be paid in the case of infectious diseases nursed at home to secure immediate disinfection of infected articles, and some of the routine terminal disinfections will be discontinued.

In previous annual reports it has been shown that the death-rate from cancer is higher in the three east coast towns, Edinburgh, Dundee, and Aberdeen, than in the three west coast towns, Glasgow, Paisley, and Greenock. Dr. Kinloch, however, shows that when correction is made for age and sex of the populations of these six towns the difference in the cancer death-rate straightway disappears. Aberdeen experience shows that diabetic patients receiving insulin treatment fail to benefit to anything like the full extent owing to lack of adequate supervision and control. The city council in April, 1924, decided to make insulin treatment available for neccessitous cases, and Dr. Kinloch thinks that the small additional expenditure involved in establishing a diabetic clinic, in order to see that the insulin treatment gives the best possible results, would be well worth while. Two years ago a biochemist was appointed at the laboratory of the City Hospital, and, in view of the results obtained by the application of methods of nutritional science to the dieting of the sick and the well, Dr. Kinloch hopes that the contemplated development of a nutritional laboratory will not be unduly delayed.

Some measure of improvement in the deadlock with regard to housing has to be recorded, as the result of the decision of the town council to erect 300 three-roomed dwelling-houses on the Hilton estate. Dr. Kinloch urges the appointment of a town-planning committee. A town-planning scheme is called for by 1929 and the committee needs to get to work at once. In August, 1924, the council made a strong protest against the proposals in the Factories Bill, 1924, to remove the supervision of the sanitary condition of workshops from the sanitary authority to the Home Office, and urged the desirability, on the other hand, of transferring the sanitary supervision of factories from the Home Office to the sanitary authority. A considerable proportion of the report is taken up with the discussion of the joint hospital scheme and its relation to the University and to the municipal health services. Nearly every branch of the municipal health services is in need of extension and a capital expenditure of £227,000 is

foreshadowed. The annual payment for interest and sinking fund is estimated to be equivalent to a rate of 2d. in the £, and the increased maintenance expenditure is estimated as equal to a rate of 3d. in the £. In addition to this expenditure the voluntary hospital service needs extension. The Royal Infirmary has 290 beds and is in a position to maintain them. An increase to 600 beds is said to be essential. It is thought that the required capital might be found, but that it would be difficult to obtain from voluntary sources sufficient money for the maintenance of 600 beds. The services of the municipal laboratory at present cover a wide ground, and Dr. Kinloch thinks it would be prejudicial to both parties if the University laboratories were to absorb the work of the municipal laboratory.

Dr. Kinloch is opposed to the farming out of municipal statutory services to voluntary bodies, and instances the inadequacy in Aberdeen of the schemes for dealing with venereal diseases and antenatal work. The existing state of knowledge with regard to light treatment is dealt with fully in the report, and Dr. Kinloch points out that even heliotherapy is possible in Aberdeen, with a fair degree of regularity, from the beginning of April to the end of October. The report concludes with coloured photographs of children receiving heliotherapy in Aberdeen on April 4th, 1925. The reasons for the excessive infant mortality-rate in Aberdeen are discussed and admitted to be somewhat obscure in the present state of knowledge.

SCHOOL MEDICAL SERVICE.

THE following are some of the school health statistics for Cardiff, Hull, and Leeds for 1924 :—

Name of district.	No. on roll.	Av. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Cardiff	36,365	—†	9,922	8,605	16.8
Hull.. ..	—†	—†	14,054	11,147	9.0
Leeds	—†	—†	19,309	53,996	30.1

* Excluding dental defects and uncleanness.

† Not given.

Cardiff.

"The absolute limit of the capacity of the present staff and accommodation has been attained. . . . At the time of writing 622 cases are awaiting preliminary examination at the throat and nose clinic; 42 are awaiting operation for enlarged tonsils and adenoids; 237 are on the list for examination at the vision clinic; and 382 must take their turn for notice to attend the ordinary inspection and minor ailment clinic." So reports Dr. R. M. F. Picken, and nothing could further describe the inadequacy of provision for the school medical service. Only one dentist is employed in a vain endeavour to cope with a school population of 36,365. No provision as yet exists for physically defective children, though an orthopaedic scheme has been approved by the board. Fifty-one partially blind and 27 partially deaf children are in attendance at ordinary elementary schools. No open-air schools are provided for delicate and pre-tuberculous children to the number of more than 200, and the provision for mental defectives is totally inadequate.

In a special report Dr. Picken outlines the minimum provision required to cope with school inspection, but states, "there is some concern at the expansion of this 'unremunerative department.'" On merely material grounds we think that "unremunerative" is entirely a misnomer. Many school medical officers have proved that inspection and early treatment of school-children directly pays for itself by increase of grant to the local authority, quite apart from the economic

gain to the community, which should be apparent to any far-seeing authority.

Much good work has been done under great difficulties by Dr. Picken and his colleagues. Dr. H. L. Coulthard reports on the grave sequelæ of encephalitis in the few cases that have occurred in the district. He also points out how X ray treatment of ringworm has reduced the loss of school attendance from 98 days to 61 days on the average. On following up 237 cases of enlarged tonsils and adenoids, he finds that subsequent to operation there is marked relief from colds, sore-throats, earache, deafness, and otorrhœa, but that there is no evidence of increased innate intelligence apart from the increased vivacity and response due to improved health and hearing. In the course of the statutory school examinations for mental defectives, 77 were classed as mental defectives, 52 as imbeciles, and 18 as idiots; the proportion of imbeciles and idiots is so high as to suggest that the standard adopted is unusual.

Hull.

Dr. J. W. Fraser's report contains so much of special value that we are obliged to pass over the more ordinary topics to leave space for some unique features. There is in force at Hull the excellent and unusual practice of testing the vision and hearing of every child at the age of 6 years. The school for the physical defectives is conducted on somewhat exceptional but most beneficial lines, the objective being the care, and not only the safe-guarding, of those permanently crippled. Remedial treatment is given and 20 operations were performed there in the year. The orthopaedic surgeon's report deals with the working of the school since its inception and deserves more extended notice. One of his conclusions is that if the children were brought early enough some types of defects would almost cease to exist. During the four and a half years that the school has been in operation 37 cases were discharged, and 70 per cent. of them are now practically fit. On this question of after-history Dr. Fraser gives authoritative statistics of those leaving the deaf and the mentally defective schools. Since 1914 32 children who have left the deaf school have been followed up, and 26 of them—i.e., over three-quarters of the whole number—are in some kind of work. Thirteen of these are earning between £1 and £2 a week, and only two are permanently unemployed. When we consider the useless and unhappy lot of the ordinary uneducated deaf person, this record is most significant and encouraging.

A similar careful account was kept of persons discharged from the mentally defective school in the ten years. Of 177 whose after-histories could be traced, 56 are in institutions, including 6 in Poor-law institutions; 60 are living at home without definite employment, but 33 of these are females, and are, no doubt, more or less engaged in housework; and 54 are in some kind of paid employment. Twenty-nine others are in precarious occupations, as, for instance, errand boys and newspaper boys, in which, however, many of them make a good sum weekly. A table gives details of the nature of the occupation and the wages earned. Dr. Fraser states that just over 10 per cent. of all discharged are earning over £1 a week. We can, perhaps, say that there are three groups: (1) Those in institutions or living uselessly at home. (2) Those who are following precarious or doubtful occupations. This would include the 29 boys selling newspapers, &c., some of the girls at home, and the persons earning less than 10s. a week. (3) Those who maintain themselves more or less satisfactorily. It is the second group who are difficult. The most economical alternative appears to be, to train them when older in institutions and then licence them out to work, as is done in the American system, or to transfer them to schools for older children where there is much manual training of vocational type. Subsequently they should be kept under strict supervision. In Hull "craft" classes for the dull and backward are successful and are being extended; we wonder

if somewhat similar training might be tried on the higher grade and older mentally defectives. Dr. Fraser concludes, after a special inquiry, that if a boy, on discharge from a mentally defective school, has an intelligence quotient of 50 per cent. or more, with an annual average gain of six months or more in mental age, and if his character is good and he has some manual ability, he will probably do well. There is much value in this kind of investigation. The whole report is evidence of the enthusiastic work carried out by the school medical officer and his colleagues, supported by an enlightened authority.

Leeds.

In his full report Dr. A. Wear draws attention to the great increase in attendance at the seven school clinics—viz., 32,399 more than last year, which makes a grand total of 214,902 attendances during the year under review. Ringworm of the head, while showing a diminution, is still very prevalent. Ionisation for discharging ears is still under trial at the public dispensary. Notice is drawn to such conditions as flat-foot, accompanying malnutrition. At present no payment is made to the local hospitals for the operative treatment of tonsils and adenoids, but it is hoped that this will be altered in the near future. The recommendations of the Board of Education and the Ministry of Health re school closure have been carried out, and Dr. Wear suggests that more parental care is necessary to reduce the amount of infectious sickness. "A case of scarlet fever should be looked upon as a source of danger for at least a fortnight after return from hospital or disinfection of the home, and the child should not be permitted to mix with other children until after plenty of exercise in the open air."

Sir G. Newman, in his last report, stated that the average number of dental fittings is about 75 for every 100 children treated. In Leeds the proportion is 72 for every 100, and Dr. Wear regrets that the parents do not take more advantage of the excellent facilities for dental treatment which exist in the city. The dental tables show the amount of work done among the elementary school population; 48,858 were examined by the dentists. 31,609 required treatment, and 13,792 actually received treatment. On the other hand, in the secondary schools 4276 children were examined, 2402 required treatment, and only 103 accepted treatment. Such figures as these raise the question whether secondary school-children are not sacrificed at the shrine of respectability to the detriment of their physical welfare. Adequate provision is made for day-school education of mental defectives, but considerable difficulty is experienced in placing children who require residential treatment. Dr. Wear believes that increased manual education will considerably help in the solution of the employment outlook of mental defectives—a view which is rapidly gaining ground generally—and few will disagree with him when he states that more manual work in the cripple school will improve the wasted muscles and the stiffened limbs. The popular desire for decent living conditions is shown by the granting of prizes by the *Yorkshire Evening Post* for "mothercraft," "care of the teeth," and for essays on the latter subject. Many hundreds of mothers and children in the district entered for these and much good has resulted both directly and indirectly.

At the camp school, financed by the Leeds Elementary Schools Athletic Association, over 1400 children spent an enjoyable and profitable week; but a week is all too short to obtain the full increase in physical and mental vigour which invariably results from such a change.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 12TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 36; scarlet fever, 1510; diphtheria, 835; enteric fever, 106; pneumonia, 417; puerperal fever, 36; cerebro-spinal fever, 6; acute poliomyelitis, 19; acute polio-encephalitis, 2; encephalitis lethargica, 40; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 114. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 4 deaths from enteric fever, 7 from measles, 3 from scarlet fever, 31 from whooping-cough, 11 from influenza, and 30 from diphtheria. There were 219 deaths of children under 2 years from diarrhoea and enteritis, as compared with 230, 218, 177, and 136 in the preceding weeks. In London itself the deaths from diarrhoea and enteritis in children under 2 years numbered 43, as compared with 38, 40, 28, and 20 in the preceding weeks; there were 8 deaths from diphtheria, 5 from whooping-cough, and 1 from influenza.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs.: A. I. Sheldon and J. P. Shorten to the *President*, for R.N. Medical Store Depôt, Deptford.

Surg.-Lt. (D) D. C. Lamond to be Surg.-Lt. Comdr. (D).

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. L. P. Spero to be Surg.-Lt.

Proby. Surg. Sub-Lt. A. T. G. Thomas to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Capt. H. T. Findlay is granted the temp. rank of Maj. whilst empld. as a Dep. Asst. Dir. of Pathology.

Capt. W. E. Tyndall is granted the temp. rank of Maj. whilst empld. as a Dep. Asst. Dir. of Pathology and Hygiene.

ARMY RESERVE OF OFFICERS.

Capt. A. L. Taylor, from R.A.M.C., T.A. Res., to be Capt.

Capt. I. Aubrey, late R.A.M.C., Spec. Res., to be Lt.

TERRITORIAL ARMY.

Maj. P. D. Warburton (Capt., Res. of Off.) resigns his commn. in the T.A.

ROYAL AIR FORCE.

F. B. C. L. B. Crawford is granted a short service commission as a Flying Officer for three years on the active list.

Flight Lt. F. E. Johnson is promoted to the rank of Squadron Leader.

Flying Officer L. P. McCullagh is promoted to the rank of Flight Lt.

Flight Lt. J. S. Wilson is transferred to the Reserve Class D.2.

INDIAN MEDICAL SERVICE.

Capt. J. Findlay, W. C. Spackman, N. M. Mehta, and C. H. P. Allen to be Maj. S.

Bhalchandra Kondopant Phatak and Gurbakhsh Dhamrait Rai to be Temp. Lts.

The King has approved the retirement of Col. F. L. Blenkinsop.

Lt.-Col. J. McPherson, civil surgeon, Peshawar, and Agency Surgeon in the Khyber, has been appointed Residency Surgeon, Mysore, vice Lt.-Col. R. Standage, proceeding on leave pending retirement. Lt.-Col. H. A. J. Gidney has resigned his seat on the Legislative Assembly. Lt.-Col. J. W. McCoy, civil surgeon, Lakhimpur, has been transferred to Sylhet. Maj. D. L. Graham, civil surgeon, Sadiya Frontier Tract, has been transferred to Sylhet. The following are granted leave: Capt. G. D. Malhoutra, Indian Station Hospital, Allahabad; Maj. A. C. Anderson, Jail Department, Madras; and Lt.-Col. R. P. Wilson, Officiating Surgeon-General with the Bengal Government.

The Future of the Service.

With reference to the optimistic views which have appeared in THE LANCET with regard to the future of the I.M.S., it is interesting to note that only a few weeks ago the editorial columns of the *Pioneer*, which represents more or less the official view of Indian affairs, had the following remark: "Sir James Roberts, who had an exceptionally prosperous career in India, is strongly of opinion that the future of his old service, the I.M.S., is promising for Europeans. In a letter to the *Times*, indeed, he makes a general protest against ex-officials dissuading young Englishmen from entering the Indian Services, where, according to Sir James, 'a fine career awaits them.' As for the I.M.S., it provides 'just the life to suit an Englishman—responsibility, position, sport, and adventure.' The fact remains that there is no desire shown by young doctors at home to enter this fascinating service, while European members of the I.M.S. actually serving in India, so far from sharing Sir Robert's enthusiastic optimism, apparently consider that a service which has done magnificent work for the people of this country is doomed."

In a Royal Warrant recently signed it is laid down that in the interests of the Service an officer of the Indian Medical Service, holding the appointment of Director, I.M.S., in India, shall be placed on the retired list on attaining the

age of 60. This decision involves a reversion to an arrangement which was altered some time ago. On attaining the age of 57 a Major-General of the I.M.S. was compelled to retire by the change referred to, but now, when he becomes Director of Military Services, he will not be placed on the retired list until he reaches the age of 60.

The Government of Madras have approved of the proposal of the Principal of the School of Indian Medicine to give stipends to women students of the School. The stipends will be granted at the rate of Rs.20 per mensem, and the number of stipends awarded in one year will be subjected to a maximum of five. The stipendiaries will be supplied with books and instruments at the cost of the Government, and, on the completion of the course, they are liable to serve the Government, if required, for a period of not less than five years.

Sanction has been accorded, with approval of the Secretary of State, to the employment of six specialists in medicine

with specialists pay at Rs.75 a month. Sanction has also been accorded to the employment of one additional specialist in surgery, and one specialist in electrical science, in the Waziristan district.

TINNED FOOD IN THE BRITISH ARMY.

Recent Army Orders in reference to messing enjoin that all tins containing food must be thoroughly examined and none accepted which bears traces of rust round the joints or which is badly dented. Emphasis is laid on the fact that tinned salmon, herrings, potted meat, and fish-paste will quickly become unfit for consumption if left in the tins after they have been opened. It is also pointed out that the necessary ingredients for making fish-cakes and similar dishes should be prepared before the tins containing the fish are opened, and that these dishes, when prepared, should be cooked without delay.

Correspondence.

"Audi alteram partem."

THE CONTROL OF VENEREAL DISEASES.

To the Editor of THE LANCET.

SIR,—Some four years' experience in the industrial towns and county districts of Lanarkshire has convinced me that it is in our large cities that the solution of the venereal diseases problem must be found, and that the health of rural communities can best be protected by the effective control of these diseases in urban areas. On p. 43 of the Annual Report of the Scottish Board of Health for 1920 the following statement is to be found: "When in every district in the country a patient can secure treatment with reasonable convenience and due promptitude, the Board will be free to turn to . . . the problem of considering whether in the interests of the community it should not be made a matter of compulsion that persons contracting these diseases shall have recourse to treatment and shall continue in attendance for a period sufficient to ensure full results therefrom." To-day adequate facilities for treatment are provided. Is it not time that something more was done to stamp out venereal disease?

Treatment has done much, and venereal diseases are rightly believed to be diminishing; but those intimately connected with clinical work best know how unsatisfactory and inadequate is our control over them. The infected individual, the uninfected public, the qualified practitioner, the unqualified quack, and, last but not least, public health authorities—all these are playing a part in postponing the day of victory in the antivenereal campaign. Some infected persons never come for treatment at all because their symptoms are slight and tend to disappear spontaneously; others abandon treatment as soon as it has removed the obvious manifestations of the disease; few report early enough. All these classes of case are liable to pass on the disease to others, and interrogation reveals that the average male patient is even ignorant of the uses of the simplest prophylactic measures. These are some of the shortcomings of the patient himself; a further obstacle to his proper treatment is the unenlightened state of public opinion. Attendance at a clinic by venereal sufferers is a public duty designed to protect the health of the community, and the performance of this duty must be encouraged. There is something to be said for the idea of doing away altogether with the term "venereal," inventing some fresh name, proclaiming it as a deadly disease, and treating the victims as in-patients in isolation hospitals.

Gonorrhoea is still far too lightly regarded by many medical practitioners, who delay sending patients to a clinic until the ordinary palliatives (and provocatives) have failed, and, notwithstanding the Regulations of 1917, quack treatment of venereal disease has not been completely stamped out. There are some unscrupulous persons who are evading the law; and this reflection naturally leads to the fifth class of

offender—those responsible for public health administration. Failure to prosecute the first detected case of unqualified treatment is short-sighted leniency, because by its very nature the offence is one which but seldom comes to light. Slackness in giving effect to the provisions of the Mental Deficiency Act of 1913 allows feeble-minded females to indulge in sexual promiscuity and to spread venereal disease. It is also regrettable that the civil authorities should tolerate without protest the discharge from the Navy of uncured cases of gonorrhoea, and condone the system which virtually makes the acquiring of gonorrhoea grounds for discharge from the Service. In our prisons, too, full advantage is not being taken of the opportunity to treat by modern methods prisoners with latent or active venereal infection.

The question of what further measures are needed to hasten the ebb of the tide of venereal disease seems to divide medical opinion. All are agreed on the desirability of raising the general standard of sex morals. For the rest, the hope of many seems to lie in further advertisement of the necessity for early treatment and of the provisions made therefor, in a higher standard of treatment of gonorrhoea, and in good advice given to patients at clinics regarding the prevention of marital and congenital infection. Short of applying legal compulsion to infected persons, is there anything further that might be done to prevent the spread of venereal disease? In some cases defaulting patients might be persuaded to resume treatment if visited in their homes by plain-clothes members of the sanitary staff; the prohibition of the sale by chemists of ad hoc preventive disinfectants might, with suitable safeguards, be removed; the sale of drugs or appliances of known or reputed value in treatment might well be prohibited except on qualified prescription, and more thorough supervision by local authorities of mentally defective girls and moral imbeciles, with routine examination for disease on admission to institutions, is urgently required. All these measures will doubtless tend to a slow reduction of venereal disease. But if gonorrhoea and syphilis are ever to cease to be endemic something more than our present methods is required. The essential problem is to get at a comparatively small number of infected men and women in our big cities who are responsible for keeping the disease going. Careless of everything they go on spreading the poison. How are they to be dealt with?

In Scotland opinion has got so far as discussing what form notification should take; but notification is relatively worthless by itself unless the onus of notifying is laid on the infected person and unless failure to undergo satisfactory treatment can be adequately penalised. Any attempt to punish those who discontinue treatment, without also penalising failure to report symptoms, would defeat the object we have in view. To compel infected persons to present themselves for treatment may be contrary to common law, but, if so, it is obvious that the law can be altered. So long as we go on dealing with only those who come voluntarily for treatment to our clinics, and so long as a big percentage of these patients leave off treatment while still potential sources of infection,

we are merely playing the part of public health quacks—treating the symptoms but neglecting the cause of what is both a social and a physical disorder. Clamant as are the calls for housing and economic improvements, and desirable as is the raising of the general standard of sex morals, it should be recognised that venereal disease need not remain with us until Utopia arrives. It is a question not of morals but of medicine. Disease is merely an unfortunate accidental accompaniment of venery, and such accidents will not happen in well-regulated communities. The problem of sexual immorality is not identical with that of venereal disease, and we must take the risk of making the world safe for profligacy. Venereal disease is the most easily preventable of all diseases, and it should not be beyond the power of medical science to stamp it out. The virus is short-lived outside the body; infection is possible only by close contact. Early thorough treatment prevents the disease being passed on to others. We have the knowledge; all that is required is the will and the courage to make practical use of that knowledge.

Let the transmission of venereal diseases be made an offence against the law of the land. Let each individual case of fresh infection be followed up ruthlessly and inquisitorially, with as much thoroughness and as much determination as is shown now in eradicating other and less harmful diseases. To do less is wicked wastefulness and cowardly procrastination.—I am, Sir, yours faithfully,

ROBERT FORGAN, M.D., D.P.H.,
Executive Medical Officer, Lanarkshire
Joint V.D. Scheme.
Sept. 14th, 1925.

*** In Edinburgh the percentage of patients who fail to complete their treatment at V.D. centres fell from 40 in the year 1920 to 11.9 last year. Among certain classes of patients the leakage was very small indeed, as may be seen from the report on p. 670.—Ed. L.

RHEUMATIC INFECTION IN CHILDHOOD.

To the Editor of THE LANCET.

SIR,—In the investigation of the problem of rheumatism which is engaging so much attention at the present time there appears to be a danger lest the fundamental nature of the disease should become obscured. While the possible influence of some "germ" cannot be ignored, it is essential that there should be clear recognition of certain features of rheumatism in its broadest sense which are constant, easily detected, and very suggestive. Sufferers from rheumatic affections have a temperature that is normally subnormal, they have skins which are habitually inactive, and they are liable to short attacks of fever always accompanied by increase of pain and acid sweating. These attacks may be slight and overlooked, or they may present the classical symptoms of acute rheumatic fever. Rheumatic fever left to itself burns itself out in the course of a few weeks, the more severe the symptoms the sooner they disappear; though the illness leaves permanent heart-scarring it must be credited with a tendency to self-cure.

By physical measures this self-curative process may be stimulated and hastened. If artificial fever and sweating are induced there is a temporary increase in the severity of the symptoms quickly followed by rapidly progressive relief. That this view of rheumatism is not merely theoretical is abundantly proved by the results of treatment upon these lines; chorea, "rheumatic fever," subacute and chronic rheumatism in child and in adult yield to the application of moist warmth, and consequent pyrexia and sweating without the use of any drug. It would seem that the basic factors in rheumatism are an error of metabolism leading to the storage of lactic acid compounds in the tissues, and a failure of the skin to expel this poison except under the stimulus of fever.

This conception of the disease suggests that prevention is to be sought in measures that ensure healthy

skin action and freedom from the depressing influence of cold, damp, and malnutrition. Other factors may play a part in some cases, but a study of the problems of prevention and cure that does not take into account the aberration of skin activity and lactic acid metabolism is likely to be sterile or misleading in its results.

I am, Sir, yours faithfully,

C. E. SUNDELL.

Queen Anne-street, W., Sept. 21st, 1925.

To the Editor of THE LANCET.

SIR,—The meaning of "poverty" in the dictionary is given as want, necessity, defect, and its derivation is from the Latin pauper. Dr. R. Miller (THE LANCET, Sept. 19th, p. 626) applies this term to the working or artisan class, an indictment that calls for immediate action on the part of the community, if what Dr. Miller says is correct. What I tried to emphasise was that the majority of post-rheumatic and post-choreic heart cases are to be found in those who partake of neither of the great lime-bearing foods—milk and eggs—amongst the poor, because they cannot afford them, and amongst the well-to-do because of a great dislike to those foods.

I am, Sir, yours faithfully,

G. ARBOUR STEPHENS.
Swansea, Sept. 19th, 1925.

PERSISTENT DIARRHŒA IN PHTHISIS.

To the Editor of THE LANCET.

SIR,—One of the most serious complications of a pulmonary, peritoneal, or general tuberculosis is persistent diarrhœa. This enteritis is not necessarily tuberculous; it may be in part or altogether septic, but in any case it is a happening of evil omen. Fishberg speaks of that form of diarrhœa which comes on late in pulmonary tuberculosis as almost invariably fatal and rapidly fatal. It is peculiarly disappointing to the practitioner treating pulmonary tuberculosis by artificial pneumothorax, when this diarrhœa, at first casual, then frequent but intermittent, and finally persistent, attacks a patient whose lung has been collapsed, apparently to a stage of complete arrest. Then may come this sequela, a rapid extinction of vitality, and then death.

I have sometimes wondered whether artificial pneumothorax has, in one or two cases out of a large number, produced this diarrhœa; but I have then remembered that it is so common a sequel where no such treatment has been tried that I have not been able to see cause and effect in the chain of occurrences. Treatment may be successful in slight cases, but may utterly fail, and I think it generally does where the enteritis is of vast extent. A recent French remedy is salicylate of alumina. I have only tried it in very advanced cases, and I am not frowning on its use when I say that in these very advanced cases it has done no good. Acetate of lead and opium, and sulphate of copper and opium, and pulv. confect. arom. cum opio are all of value. Washing out the bowel with large enemata is advised by some, but may cause intense pain.

The remedy which I have found of the most value has been bismuth subcarb. in elephantine doses; I have given single doses of from ʒiv. to ʒii. (In giving such a dose of bismuth subcarb. it must be guaranteed practically free from arsenic.) I have found no remedy to equal this. One large dose taken in milk, the patient drinking it slowly and taking, perhaps, two hours in swallowing one dose, has often cut short an attack of this distressing diarrhœa. It cannot be repeated for three days, but other remedies, especially pulv. confect. arom. cum opio, can be continued. I have known this treatment to be of great benefit in persistent mucous colitis. It is hypothetically possible that such a large dose of bismuth may produce intestinal obstruction. I have met with no such result.

I am, Sir, yours faithfully,

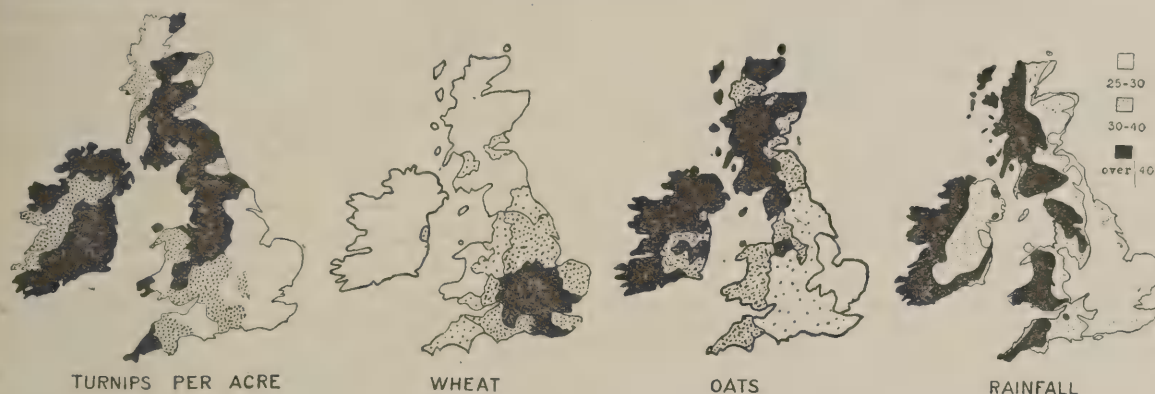
H. DE CARLE WOODCOCK.
Leeds, Sept. 21st, 1925.

THE GEOGRAPHICAL DISTRIBUTION OF HEART DISEASE.

To the Editor of THE LANCET.

SIR,—The interesting map published in your last issue by Dr. Matthew Young recalls in a striking way the distribution in these islands of a number of other phenomena. I give as examples the yield of turnips per acre, the proportions of land occupied by cereal crops which are used for oats and wheat

west to east, say from Hereford to London, and look out of the railway carriage window to appreciate that the conditions of life are not the same, and it is not difficult to believe that ugly (but waterproof) modern cottages and well-tilled clean fields may be better for the health of the inhabitants if they leave little "real country" for holiday-makers. These very brief indications show the inter-related complexity of the subject. Temperature seems to have relatively little influence; in winter the country is progressively cooler from west to east, and in summer from south to



respectively, the distribution of the snails *Hygromia fusca* and *Theba cantiana*, and of the pearl-mussel *Margaritana margaritifera*, and lastly, the rainfall, which, though a commonplace, is often overlooked. Historians also remark that in the Civil War the country to the south and east of a line from Hull to Gloucester and Plymouth was for Parliament, and that to the north and west for Charles. The distinction between north-western and south-eastern is evidently of wide and varied biological significance, and its explanation is probably discoverable by careful statistical analysis, such as Dr. Young's, though the pitfalls in correlating variables are sufficiently

north, and there is no period at which the distribution of temperature corresponds for any length of time to the biological divisions.

I am, Sir, yours faithfully,

Radlett, Herts, Sept. 19th, 1925.

A. E. BOYCOTT.

"SMALARINA" IN MALARIA.

To the Editor of THE LANCET.

SIR,—In your issue of June 27th I read a brief clinical report by Dr. G. C. Low and Dr. A. L. Gregg on my method of malaria therapy with smalarina. There are, however, some slight mistakes in that note in connexion with the practical application of this method as reported, and these I should like to discuss. Dr. Low and Dr. Gregg, when treating their patients, had probably not read my papers and pamphlets or had forgotten the rules I suggested for carrying out the treatment. From their report I gather that:—

1. The patients, when the smalarina treatment was started, were feverish, that is, in an acute stage or in a state of relapse.

2. Smalarina was administered in order that the fever might abate at a fixed time.

3. Since the fever did not abate, quinine was given, and in a (relatively) short time this treatment established a rapid convalescence with the disappearance of the parasites from the peripheral blood-stream, of fever, and of splenic enlargement. These fortunate results were attributed to the administration of a few doses of quinine.

It is to be noted that no treatment with quinine alone was carried out as a control.

The points I wish to raise in regard to the above results are as follows:—

1. In all my publications I have clearly maintained that the new therapy is a "biological therapy," that is, it produces an organic reaction and immunity, and is by no means a pharmaceutical, symptomatic, febrifuge treatment. Quinine will suffice to fight the fever.

2. So far as smalarina treatment is concerned, it must be remembered that it is not suited for the acute stages of malaria because there the administration of quinine is necessary to reduce the fever. Smalarina tends to provoke an immunity against malaria.

3. The therapeutic action of smalarina manifests itself sometimes a little late. This action appears very often associated with a feverish reaction, which on analogical grounds I have named Herxheimer's reaction.

4. One of the first symptoms in connexion with the reaction to the smalarina stimulus is the rapid diminution of the splenic enlargement.



Distribution of three molluscs: (1) *Hygromia fusca*; (2) *Theba cantiana*; (3) *Margaritana margaritifera*.

illustrated by the examples I have given; it is unlikely that the parasite which causes acute rheumatism lives in the turnip, or that there is an anti-rheumatic emanation from *T. cantiana*. Taken in a broad way it seems much more likely that the dominating factors are dryness and what we may call civilisation. The actual rainfall in the south-east is much less, the calcareous strata of which it is largely composed are more permeable, a more intensive and thorough agriculture helps to keep the surface dry, which is, indeed, the effect of many modern improvements like street paving and tarred roads; there is much evidence that the south and east of England has become progressively drier during the last 100 years. Associated with this dryness in many such ways is a different standard of living. When Caesar came to Britain he found culture at its highest level in the south-east, and, excepting, of course, Manchester, the same remains roughly true to-day; it may be because the south-east is nearer the Continent, or because its sunshine is more cheering than the rain of the north-west, or because, for a variety of reasons, it is more prosperous. But it is only necessary to travel across England from

5. It is consequently necessary, as I have already pointed out, that the after-care of the patients be continued sometimes for one or two months. During this time the characteristic symptoms of the disease are gradually disappearing and a general improvement in health becomes manifest.

Let us consider now the action of smalarina. Since this compound is not a febrifuge, it is hardly reasonable, for all practical purposes, to expect that the fever should abate after its administration. I have never maintained the febrifuge action of smalarina. Dr. Low and Dr. Gregg have done well in giving quinine in their cases, but quinine would have not been either advantageous or necessary in the subacute, chronic, masked, and latent malaria forms. Although no clinical control was carried out by using quinine alone, the rapid recovery which the patients made on the administration of quinine, and the rapid diminution of the splenic enlargement in the cases reported, should surely cause some surprise if that effect is attributed to the quinine. Either the recovery is a symptomatic one, manifested in the cessation of fever and the disappearance of the parasites from the peripheral blood-stream, but leaving the patient still infected with malaria, or it may be considered as sterilisation with a rapid improvement of the subject and rapid diminution or disappearance of the splenic enlargement. In the first alternative the quinine may really be the effective factor, in the other this drug may not play any part, but we may be dealing with the self-protective action of the tissues, as in recoveries which are spontaneous or are provoked by a biological stimulus. If Dr. Low and Dr. Gregg follow up their three patients they will discover that the splenic enlargement has entirely disappeared and that the fever will not recur. This result never occurs after such brief treatment with quinine. The whole malaria problem belies such optimism.

To obviate certain mistakes in such clinical experiments I should like to make the following points clear. When we treat a patient with smalarina, we must forget our ideas on the pharmaceutical therapy, particularly on the usual method of treatment. The practitioner usually takes note of the most evident symptom, the fever, which indeed does not represent the disease (nor when it disappears has the disease been eradicated), but he does not take note of the deep-seated constitutional lesion which is produced by an hereditary defect. The new biological therapy produces an organic reaction occurring at various times according to the organism in question. It represents, therefore, a result of a natural law and arises when Nature wishes. If we treat a patient with the new method and expect some determined results at a fixed time, that means we claim that our law is superior to natural law.

By limiting himself to observation of results the malariologist will not only see his patient's recovery but also a series of very interesting and unexpected phenomena, as did those colleagues who have obtained fortunate results by following the method according to the rules that I have suggested. Treatment will not be successful if carried out under wrong conditions. The bad results, however, that we obtain in these cases appear to be only transitory, and the proof of this lies in the fact that we clearly see the advantages of the new method when we follow up the patients for some time after treatment. Chemical therapy, as rapid as it is ephemeral, has made us accustomed to expect some prompt results, and when these are not forthcoming we say the therapy has failed. If, however, a therapeutic method can produce an organic reaction (feverish reaction) after 10-15 days of treatment and a sterilisation after one or two months, it is evident we are dealing with something which is not a "pharmaceutical" treatment. Until we have thoroughly and at length experimented with this "something," we cannot say it has failed to produce the desired results.

The cases and method of application of Dr. Low and Dr. Gregg do not conform to the postulates I have

established—namely, a rigorous application of some therapeutic rules that I have published after many years of diligent research.

I am, Sir, yours faithfully,

Rome.

GUIDO CREMONESE.

JOURNALS FOR MEDICAL MISSIONARIES.

To the Editor of THE LANCET.

SIR,—May I, through your columns, make known the need of medical literature for members of the medical profession who work in hospitals scattered over the world? I have at the moment three requests for THE LANCET, and would gladly supply addresses to which such literature should be sent regularly.

I am, Sir, yours faithfully,

JANET BRADBURY,

S.P.G. Sec. for Medical Literature.

Darenth House, Sandgate, Kent, Sept. 19th, 1925.

MACLEAN'S "LAG" BLOOD-SUGAR CURVE.

To the Editor of THE LANCET.

SIR,—MacLean has specially called attention to a peculiar disturbance of blood-sugar regulation characterised by what he calls the "lag" blood-sugar curve.¹ By this name he denotes a condition in which, when a sugar-tolerance test is performed in the way he describes,² blood-sugar rises above the normal threshold value of about 0.18 per cent. within half an hour after the ingestion of sugar, but goes down again very quickly and is quite normal within two hours (or, in the old, within three hours) after the ingestion of sugar. A more or less important glycosuria is also produced.

A point of great practical importance is the prognostical significance of this type of blood-sugar curve. For the present, MacLean takes the view that "a patient who gives this lag type of curve, but who shows no delay in the return of blood-sugar to normal after ingesting sugar, is probably not suffering from a defect which is likely to prove prejudicial to his carbohydrate metabolism."

I have recently seen a case which has, I believe, some interest from this prognostical point of view.

J. M., aged 66. Thirty-six years ago sugar was found in the urine. A slight food restriction banished the glycosuria, which was constantly found absent so long as the food restriction was maintained. A few years later both food restriction and urine examinations were discontinued until 1918, when a urine analysis was again performed and sugar was found. Since then the analyses have been frequently repeated and glycosuria has always been found, varying from traces up to 3.0 per cent. Changes in glycosuria have been found to correspond with those in the diet. Food restriction was never very serious, bread and potatoes, for instance, being never omitted. No diabetic symptoms were noticed at any time. The patient has always felt very well and vigorous. At present he is an exceedingly healthy-looking old gentleman, is not, and has never been, over weight, and his blood pressure is 120/75.

A blood-sugar tolerance test, with 50 g. sugar, performed on Sept. 2nd, 1925, gave the following figures:—

	Blood-sugar per cent.	Urine sugar per cent.
Fasting	0.11	Nil
30 minutes after ingesting sugar	0.205	—
2½ hours " " "	0.10	1.3

The main interest of this case lies in the fact that a blood-sugar regulation disturbance of the "lag" curve type has existed for at least 36 years, neither being the cause of any clinical disturbance except glycosuria, nor showing any tendency to pass into a true diabetes, despite the fact that no serious diet has ever been kept and that, probably, glycosuria has constantly been present, except for a short number of years after it was first discovered. This

¹ Hugh MacLean: Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes, second edition, London, 1924, p. 42.

² Loc. cit., p. 31.

case is therefore strongly in favour of MacLean's optimistic opinion on the prognostic significance of the "lag" blood-sugar curve. It is also of interest to remark that in this case of non-diabetic dextrosuria, as, probably in all those of the same type, changes in diet are followed by changes in the daily excretion of sugar of the same type as those met with in true diabetes, in opposition to what is seen in typical renal glycosuria and other non-diabetical glycosurias. This fact emphasises the importance of performing sugar-tolerance tests, with blood-sugar determinations, in all cases of glycosuria in which the diabetic nature of this symptom is not quite evident, even when it may seem possible to exclude renal glycosuria and other non-diabetic glycosurias, such as lævulosuria, pseudo-lævulosuria, &c.

I am, Sir, yours faithfully,

R. CARRASCO-FORMIGUERA.

Barcelona (Catalonia), Sept. 12th, 1925.

LUMINAL IN EPILEPSY.

To the Editor of THE LANCET.

SIR,—I have read, with great interest, the letter of Dr. Hildred Carlill in THE LANCET of Sept. 19th on a case of luminal poisoning. For the last three years I have had the opportunity of studying the action of luminal and I have found that, except in cases of epilepsy, in which cases the number of fits was reduced very considerably, the drug was very disappointing. The dose we give here is 2 gr. twice daily. Larger doses when tried as a sedative or hypnotic have not given satisfactory results, in fact very disappointing, as the patient becomes stuporous, restless, and in a few cases the sphincters were relaxed. Gradual decrease in the dose of luminal is essential, but a sudden cessation may cause the same symptoms as a large dose.

I am, Sir, yours faithfully,

S. GROSSMAN,

Assistant Medical Officer, Cardiff City Mental Hospital.

Sept. 22nd, 1925.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The Fellowship of Medicine will hold a series of lectures on Tuberculosis in the Lecture-room of the Medical Society, 11, Chandos-street, in October. The opening lecture will be delivered on Oct. 12th at 5.30 P.M. by Dr. L. S. Burrell on Tuberculosis from the Physician's Viewpoint. There is no fee for this series, and all members of the medical profession will be welcomed. During October there will also be held the following course: Diseases of the Throat, Nose, and Ear at the Central London Throat, Nose and Ear Hospital (an operative surgery class will also be held); a course in Tropical Medicine, consisting of eight clinical demonstrations on Tuesdays and Thursdays; a combined course in Diseases of Children at the Paddington Green Hospital, Victoria Hospital, and Children's Clinic; a course in Urology at St. Peter's; and a course in Dermatology at St. John's. Copies of any syllabus, together with the Fellowship programme, may be obtained from the Secretary, at 1, Wimpole-street, W. 1.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—The distribution of prizes to students by Sir Herbert Waterhouse will be made in the out-patients' hall of the hospital on Monday, Oct. 5th, at 3.30 P.M.

UNIVERSITY OF LONDON: UNIVERSITY COLLEGE.—On Monday, Oct. 5th, and Tuesday, Oct. 6th, 10 A.M. to 1 P.M., first-year students of the Faculty of Medical Sciences will be received by the Senior Tutor, the Dean of the Faculty, and the Sub-Dean. On Monday, Oct. 5th, 2.15 to 4 P.M., students of the Faculty of Medical Sciences other than first-year will be received; on the same day at 3.15 P.M. candidates for the Diploma of Public Health will be received by Mr. Delafield, Acting Head of the Department. The

new buildings for anatomy, anthropology, embryology, histology, and physiology, provided by the gift of the Rockefeller Foundation of New York, are now in full use. The list of public lectures includes six on the Study of Man by Prof. G. Elliot Smith and Dr. C. F. Sonntag, and one on the Photochemistry of Vision by Prof. Fritz Weigert of the University of Leipzig. There will also be eight lectures on the Physiology of Hearing and Vision, which will be given by Mr. R. J. Lythgoe on Mondays and Wednesdays at 5 P.M., starting on Oct. 12th.

LECTURES AT KING'S COLLEGE.—A course of ten lectures on the Histology of Nerve Tissues and Paths of Conduction in the Central Nervous System will be given by Dr. C. Da Fano at King's College, at 5 P.M., on Thursdays during the present session, beginning on Oct. 8th.

THE People's League of Health has awarded a travelling scholarship to Miss Alice Gilby, who is a second-year medical student at the London School of Medicine for Women.

At the third annual general meeting of the British Provident Association for Hospital and Additional Services, held on Sept. 21st, a resolution was passed expressing the Association's appreciation of the services of the late Dr. J. F. Gordon Dill in the cause of the voluntary hospitals of this country.

IMPERIAL SOCIAL HYGIENE CONGRESS.—The British Social Hygiene Council, which was lately the National Council for Combating Venereal Diseases, is organising a congress to be held at Wembley from Oct. 5th to 7th under the presidency of Sir Auckland Geddes. Distinguished representatives of the Dominions have agreed to take part in the discussions, and addresses will be given by Mr. L. S. Amery (Colonial Secretary), Mr. Neville Chamberlain (Minister of Health), and Lord Willingdon. The problem of venereal disease as it affects the Empire will be fully discussed.

CORK DENTAL HOSPITAL.—The honorary staff of this hospital, which forms part of the North Infirmary, have resigned in a body on a number of grounds. The staff complain, generally, that the committee of management have "persistently ignored" their recommendations, even upon matters regarding which they are especially qualified to advise, and, more specifically, that they were not consulted upon the opening of the hospital at night, and that two salaried appointments were recently made in face of their opposition. The honorary staff has been invited to a conference with the committee of management and has been asked to continue duty in the meantime.

LONDON MEDICAL EXHIBITION.—From Oct. 5th to 9th the medical profession will again have an opportunity to taste, see, or handle the products of our leading drug houses and scientific manufacturing firms at the Central Hall, Westminster, S.W. The London Medical Exhibition, which is open to medical men only, will comprise the most recent organo-therapeutic, bacteriological, and pharmaceutical remedies and prophylactics; electro-therapeutic apparatus; scientific dietary; surgical instruments; hospital furniture and medical appliances, diagnostic material, and apparatus; pathological and physiological apparatus; artificial limbs, aids in invalidity and deformity; sick-room requisites; natural and artificial hydrotherapy; professional literature; hygienic clothing, and so forth. Invitation cards can be obtained from the secretary of the exhibition, 194-200, Bishopsgate, London, E.C., or at the Central Hall during the exhibition. The exhibition is exclusively for members of the medical profession.

DONATIONS AND BEQUESTS.—By the will of the late Mrs. Catherine Ada Potter, of Llandaff, the testatrix left £1000 to Cardiff Royal Infirmary "to endow a bed in a ward to be called the Catherine Ward," and £100 in addition "on condition my grave is kept in good order and looked after by such infirmary." Among other bequests she left £100 to the Cardiff Blind Institution.—The Manchester Royal Infirmary has received £10,000 on account from a legacy by the late Miss Ann Russell.—Mrs. Ellen Margaret Smith, Aughton, Lancashire, who left £12,914, besides other bequests, including certain sums to her husband, left on his death £500 each to the School for Indigent Blind, Liverpool, the Hospital for Women, Liverpool, and the Ormskirk District Nursing Association.—The Christie Hospital, Manchester, has received a donation of £1000 from Mrs. Taylor, of Whalley Range, to endow a bed in memory of her husband and brother-in-law, Mr. Henry Marsland Taylor and Mr. James Henry Taylor, two of Manchester's oldest solicitors.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Thursday, Oct. 1st.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Specimens:

Mr. Beckwith Whitehouse: (1) Endometrioma invading Bladder, from a patient who had never menstruated. (2) Intra-ligamentary Endometrioma.

Short Communications:

Mr. A. C. Palmer: Acute Purulent Salpingitis at the Third Month of Pregnancy.

Dr. A. P. Thomson and Dr. Lamb: Malignant Endometrioma with Metastases in the Lungs.

Paper:

Dr. I. C. Rubin, of New York (introduced by Mr. Clifford White): Diagnostic Value and Therapeutic Application of per-Uterine Insufflation of the Fallopian Tubes in Cases of Sterility.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

MONDAY, Sept. 28th, to SATURDAY, Oct. 3rd.—WESTMINSTER HOSPITAL, Special Post-graduate Course in General Medicine and Surgery, and the Special Departments. 10.30 to 5.30 daily. Demonstrations, lectures, &c. Second week.—HOSPITAL FOR CONSUMPTION AND DISEASES OF CHEST, Brompton. Post-graduate Course in Diseases of the Chest. Operations, lectures, lecture-demonstrations, demonstrations of surgical cases, of cases in wards, and in special departments. Second week.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Lecture-demonstration on Treatment by Electrotherapy on Wed., Sept. 30th, and the two succeeding Wednesday at 5.30 P.M., by Dr. C. B. Heald: The Diathermy Current—Its Uses and Application.

OPENING OF LONDON MEDICAL SCHOOLS.

TUESDAY, Sept. 29th.—GUY'S HOSPITAL. Address by Major Ian Hay Beith (Ian Hay).

THURSDAY, Oct. 1st.—ST. BARTHOLOMEW'S HOSPITAL. Old Students' Annual Dinner in Great Hall of Hospital. Chairman: Mr. J. Adams.—CHARING CROSS HOSPITAL. Annual Dinner.—ST. GEORGE'S HOSPITAL. School Dinner at Hyde Park Hotel. Chairman: Dr. Ashton Warner.—KING'S COLLEGE HOSPITAL. 2.30 P.M., Introductory Address by Sir Arthur Keith. 7 P.M., Annual Dinner of Past and Present Students at Connaught Rooms, Great Queen-street.—LONDON HOSPITAL. Annual Old Students' Dinner, Trocadero Restaurant, Piccadilly Circus.—MIDDLESEX HOSPITAL. 3 P.M., Prize Distribution in Queen's Hall by Hon. Sir Arthur Lawley; Inaugural Address by Dr. C. E. Lakin on Tradition in Medicine. Annual Dinner, New Criterion Restaurant, Regent-street. Chairman: Sir Arnold Lawson.—WESTMINSTER HOSPITAL. 3 P.M., Inaugural Address by Prof. A. E. Gardner in Board Room of Hospital.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Sept. 29th.—4.15 P.M., Mr. H. H. Rayner: A Survey of the Treatment of Duodenal Ulcer.

FRIDAY, Oct. 2nd.—4.15 P.M., Dr. E. M. Brockbank: High Blood Pressure as a Cause of Disablement in Workers.

Appointments.

DOW, D. R., M.D., Ch.B. St. And., D.P.H., has been appointed to the Chair of Anatomy, University College, Dundee.

GIRL, D. V., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., O. Oxf., Honorary Surgeon to the Royal Eye Hospital, Eastbourne.

HEWAT, A. F., M.B., Ch.B. Edin., F.R.C.P. Edin., Acting Physician to the Chalmers Hospital.

MUIRHEAD, JANET L. A., M.B., Ch.B. St. And., Tuberculosis Officer for the Burgh of Arbroath.

WOLFENDEN, H. F., M.D., F.R.C.S., Honorary Surgeon, Royal Infirmary, Liverpool.

Queen Charlotte's Maternity Hospital: LANKESTER, A. L., M.R.C.S., L.R.C.P. Lond., Senior Resident Medical Officer, and NELKEN, G. J. V., B.S. Lond., Assistant Resident Medical Officer.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—H.P. £125.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. and Asst. H.P. Each at rate of £100. Also Asst. S. 50 guineas.
Birmingham General Hospital.—Asst. S. £50.
Chelsea Hospital for Women, Arthur-street, Chelsea, S.W.—S. Colchester, Essex County Hospital.—Radiologist.
Delhi, India, Lady Hardinge Medical College and Hospital.—Radiologist. Rs.750.
Eastern Dispensary, Leman-street, E.—P. £65.
Hackney Hospital, 230, High-street, Homerton, E.—Jun. Asst. M.O.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each at rate of £50.
King's College Hospital, Denmark-hill, S.E.—Clin. Assts. Med. and Surg. Out-patient Officers, &c.
Lucknow University.—Prof. of Surgery. Rs.1200-50-1400.
Manchester, Ancoats Hospital.—Asst. Surg. Reg. £40.
Manchester Babies Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125. Also Clin. Asst. At rate of £50.
Manchester Royal Infirmary.—Res. M.O. and Asst. M.O. At rate of £200 and £100 respectively.
Mental Hospitals Service under the L.C.C.—Eighth Asst. M.O. £432.
Midmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Cas. O. At rate of £100.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Pathologist. £500.
Norfolk County Council.—Asst. Tub. O. £600.
Norwich City.—Temp. Asst. Sch. M.O. £11 11s. weekly.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Royal Chest Hospital, City-road, E.C.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—Registrar. £100 guineas.
Royal Northern Hospital, Holloway, N.—P.
St. Luke's Hospital, Chelsea, S.W.—Third Asst. M.O. £325.
St. Pancras Metropolitan Borough.—Asst. M.O. £600.
Salford Royal Hospital.—Radiologist. £300. Also Med. Reg. £250.
South Shields County Borough.—Ven. Diseases M.O. £750.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Throat Hospital, Golden-square, W.—Two H.S.'s. At rate of £100. Also Hon. Surg. Reg.
Torquay, Torbay Hospital.—Res. M.O. £200.
Whipps Cross Hospital, Leytonstone.—Specialist Consultant in Light Treatment. £300.
Wilkesden Urban District Council.—Two M.O.'s. Each £600.
York City Mental Hospital, Fulford, York.—Asst. M.O. £440.

Births, Marriages, and Deaths.

BIRTHS.

BUCHANAN.—On Sept. 13th, at a nursing home, the wife of John V. Buchanan, M.B., Ch.B., Dale House, Shaw, Lancs., of a daughter.
COLLINS.—On Sept. 11th, at Garden Reach, Buckhurst Hill, the wife of Dr. F. Garland Collins, of a daughter.
LYNHAM.—On Sept. 10th, the wife of Dr. J. E. A. Lynham, of The Moorings, Matham-road, East Molesey, of a son.

MARRIAGES.

DUGUID—BENZIE.—On Sept. 17th, at King's College Chapel, Old Aberdeen, John Bright Duguid, M.D., Lecturer on Morbid Anatomy, Manchester University, to Agnes Mildred Emslie, M.B., Ch.B., D.P.H., elder daughter of Mr. and Mrs. A. Emslie Benzie, of Morkeu, Culter, Aberdeenshire.

DEATHS.

GATLEY.—On Sept. 20th, at Surbiton-road, Kingston-on-Thames, Henry Ralph Gatley, M.R.C.S., aged 67.
KIRKNESS.—On Sept. 19th, at The Haven, Pembury, Tunbridge Wells, suddenly, of pneumonia following influenza, William Ronald Kirkness, M.R.C.S., L.R.C.P.
RUSSELL.—On Sept. 20th, at Haytor, Devonshire, James W. Russell, M.A., M.D., F.R.C.P., of Chad-road, Edgbaston, Birmingham, in his 63rd year.
RYAN.—On Sept. 18th, at The Laurels, Crumlin, Mon., Edmond Ryan, M.D.
SALAMAN.—On Sept. 19th, at Bayswater-terrace, London, Colonel S. M. Salaman (I.M.S., ret'd.), aged 81 years.
STEELE.—On Sept. 15th, Henry Francis Arthur Steele, M.R.C.S., aged 75.
WEBB.—On Sept. 13th, at Haverstock-hill, Vere George Webb, M.R.C.P.I., aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SELECTION OF COD-LIVER OILS FOR MEDICINAL USE.¹

By J. C. DRUMMOND, D.Sc., F.I.C.,

PROFESSOR OF BIOCHEMISTRY, UNIVERSITY COLLEGE, LONDON.

It is almost generally accepted at the present time that the beneficial influence exerted by cod-liver oil on certain conditions of malnutrition is due largely to the presence in relatively high concentrations of at least two organic substances provisionally classed as vitamins. Older theories that ascribed the action to the peculiar nature of the unsaturated fatty acids in fish liver oils, or to the traces of iodine which they frequently contain, have been disproven by the demonstration that the material which resists saponification when the oils are treated with an alcoholic solution of caustic alkalis, and which can then be separated by extraction of the soap solution by suitable solvents, contains all the active substances. Such material from the method of its preparation can contain no unsaturated fatty acids, nor is it found to contain even minute traces of iodine.

Source of Vitamins in Cod-liver Oil.

In collaboration with Dr. Zilva, of the Lister Institute of Preventive Medicine, the writer has for a number of years past carried out an exhaustive series of researches to ascertain the source of the vitamins in cod-liver oil, and the cause of the variations which occur in the amount present. The result of these studies is not without some practical interest to the medical practitioner, because quite a number of views seem to be still widely held that have been found by us to have no foundation in fact.

In the first place may be mentioned the old idea that the almost black or dark brown oils prepared by the now almost obsolete process of "rotting" the livers were much more valuable than the clear white oils that are generally sold to-day. For this view we found not the slightest experimental support; indeed, we were inclined to believe that the exposure of the "rotting" oils in vats to the open air and sunshine for considerable periods tended to decrease their vitamin content by causing oxidation.

The introduction of the modern method of steaming the absolutely fresh livers and thereby obtaining a clear white oil rapidly brought about the disappearance of the dark brown oils as medicinal agents, and led to a demand for higher grade products. Although the "steaming" process appears first to have been used by an Englishman, Charles Fox, as early as 1848 in Newfoundland, its widespread adoption is probably due more to the labours of Peter Möller in Norway during the second half of last century. He operated factories in the neighbourhood of the Lofoten Islands, and a few years after the introduction of the improved method of extraction Norway was producing clear white oils of a much higher grade of quality than formerly. The Norwegian industry, largely centred at that time in the Lofoten Islands, when putting their oils on the market made a strong point of the fact that only livers of the cod were used, and that the oils were extracted from the livers removed from the fish very shortly after they were caught. From this has grown the idea, still widely held especially in trade circles, that only oils from the liver of the cod are of medicinal value, and that Lofoten oils are the best that can be obtained.

"Pure" Cod-liver Oil.

At an early stage in our researches Dr. Zilva and I found that the oils yielded on steaming the livers of other gadoid fish—pollock, haddock, ling, coalfish, &c.—are quite as rich in vitamins as that from the cod's liver. There is, therefore, no justification for demanding that an oil to be used for therapeutic purposes should be a "pure" cod-liver oil. In some cases to make such a demand is to run the risk that a product of rather low vitamin value may be obtained, because, as we have fully described elsewhere, in Norwegian waters "pure" cod-liver oil is only made in the Lofoten and Romsdal areas early in the year when this species is spawning on the shallow sandy banks—a period in the life of the fish when there tends to be a transference of vitamins from the liver to the gonads. There seems to be no doubt from our investigations on the fishing grounds in Norway, Newfoundland, and the North Sea that the chief factor governing the amount of vitamin in the liver of the gadoid fish is their food-supply. When the fish are actively feeding their livers are usually rich in vitamins and yield clear,

pale yellow oils of very high medicinal value; on the other hand, when they are practically starving during the spawning period, and are at the same time transferring much fat and vitamin to the reproductive cells, the livers yield an almost white oil of relatively low potency.

It cannot be too strongly emphasised that it is not undesirable that oils should possess a pale lemon-yellow colour. On the other hand, it has been my experience to find that such oils usually possess a higher medicinal value than "white" oils. Only dirty yellow and brown oils, indicating unsatisfactory preparation, are undesirable.

Of the oils derived from Norway, therefore, we have usually found those from the Finmarken coast, where the fishing is carried on from June to August, while huge shoals of mixed gadoid fish pass slowly along the northern coast of Norway feeding actively on smaller species, mainly the caplin (*Mallotus villosus*), to possess the highest vitamin value. Generally speaking, they are found to be from five to ten times more valuable than the average oil prepared in the Lofoten area, although wide variations may occasionally be encountered.

High Value of Newfoundland Oils.

It is of considerable interest in the light of these observations to point out the value of the oils prepared in the Dominion of Newfoundland. Until recently the sale of oils from this source for medicinal purposes was relatively small, and they were practically ousted from the market by the strong preference for Norwegian, especially Lofoten, oils. Dr. Zilva and I ascertained, however, that the Newfoundland oils possess a very high average value as sources of vitamins, and an investigation carried out on the fishing grounds there enabled us to understand why this is so. The main fishing season, during which over two-thirds of the entire annual catch are taken, is in the summer months when the fish are off the east coast of the island, the remainder being caught in spring and winter in the Gulf of St. Lawrence, the Straits of Belle Isle, or off the Labrador coast. During the whole of the main fishing season the fish are actively feeding, early in the summer on the caplin, later on squid and herring. The oils made during this period are, therefore, found to be of high vitamin value, and comparable with the oils made in summer in the Finmarken area of Norway, with the exception that the Newfoundland oils are prepared practically entirely from cod.

Compared with Norwegian oils the proportion made during periods when the fish are spawning is very small in Newfoundland, and it is to this that Dr. Zilva and I are inclined to ascribe the high average value of the Dominion products.

Quality of the Oil from the Trade Aspect.

There remains, however, one important question that is frequently raised when the superior nutritive value of the oils from our oldest colony is emphasised—namely, the quality of the oil as viewed from the trade aspect. In the past the Norwegians have undoubtedly captured the market by the obvious superiority of their products. Their oils have been clear, free from marked coloration, and more particularly from the unpalatable characteristics of oils prepared from old livers or by unsatisfactory processes. To a large extent this superiority was the cause of the strong prejudice against oils other than Norwegian which still survives, but matters are very different at the present time. In 1916, by an Act of the Newfoundland Legislature, the production of all cod-liver oil in the Dominion was put under the control of the Ministry of Marine and Fisheries. Every manufacturer is now required to hold a Government licence, to conduct his preparation according to certain rules laid down to ensure cleanliness, &c., and to permit his factory to be open to Government inspection and supervision. Great care is now taken by manufacturers to comply with the regulations, to see that no discoloured or stale livers are placed in the vats, to remove the gall-bladders, to maintain strict cleanliness of utensils, and in all ways to produce a product of high technical and market quality. A fuller description of the actual process, as now being worked in the Dominion, is given in our report in the *Journal of the Society of Chemical Industry* (1923, lii., 185 T and 250 T).

There should no longer be any prejudice against oils from Newfoundland, and it is fully time that medical men realise that we have within the Empire a source of medicinal cod-liver oil of very high quality in every sense. It may here be remarked that an American group of scientists visited Newfoundland shortly after our investigation had been made and confirmed our conclusions in all essentials. An immediate result of this has been that a number of the chief firms in the United States interested in cod-liver oil, or preparations containing this oil, have decided to erect their own factories in Newfoundland or to employ only oil from that source.

I am indebted to Major Victor Gordon, the High Commissioner for the Dominion of Newfoundland, and to Mr. W. A. Munn for the following figures representing the annual production since 1913. If they be compared with the

¹ This communication was written at our request, as it was found that information concerning Newfoundland cod-liver oil was needed by the medical profession.—ED. L.

figures representing the Norwegian output, for which I am indebted to H.B.M. Consul at Bergen, it will be seen that there is generally an inverse relationship. This opens up an economic question which it is inappropriate to discuss here, but it is certain that Newfoundland could supply much larger quantities of oil for medicinal use in this country if its uniformly high nutritive value were sufficiently appreciated by the medical profession and the public.

Comparison of Production of Medicinal Cod-liver Oil in the Dominion of Newfoundland with the Export from Norway for the Years 1913-24.

Year.	Newfoundland.		Norway.	
	Gallons.	Value (dollars).	Hectolitres.	Kroner per hectolitre.
—	41,000	18,122	—	—
1913	45,990	69,000	45,990	69-00
1914	26,000	17,010	63,025	55-00
1915	47,700	35,837	112,800	180-00
1916	142,000	254,562	56,010	360-00
1917	214,000	471,629	23,399	240-00
1918	321,000	674,093	12,425	240-00
1919	342,000	832,352	35,283	344-00
1920	291,000	726,852	49,347	275-00
1921	43,000	79,982	71,478	92-00
1922	48,000	28,265	65,860	92-90
1923	51,000	36,967	98,290	100-70
1924	42,000	31,462	115,263	—

Oils Prepared in Great Britain.

In conclusion, brief mention should be made of the oils prepared in this country. Until quite recently the amount of medicinal oil prepared from fish landed at ports in Great Britain was negligible, the livers usually being thrown away or landed in a state of decomposition so advanced as to render them unfit for the manufacture of any form of oil other than commercial "cod oil," a technical product used mainly in the leather industry or for conversion into soap. Within the last year or two certain manufacturers have made arrangements for steaming the fresh livers on board the trawlers at sea, and an appreciable quantity of oil of quite good market quality is now being made for medicinal use. As far as Dr. Zilva and I could determine the average vitamin value of these oils is fairly high, but we have not had the opportunity of making so extensive an examination as we had in Norway and Newfoundland. The fish are caught over a wide area, extending beyond the North Sea to the Farøe Islands, Iceland, and even as far as the White Sea. Probably no great proportion of spawning fish are present in the catch, even in the early months of the year, but we have no definite information on this point. It is certain, from a considerable number of samples that we have examined, that cod-liver oils of good trade quality and high medicinal value can be placed on the market by manufacturers in this country if they are prepared to go to the trouble of working up the livers immediately after the fish are caught. Usually this means the installation of steaming plants, which, however, may be of very simple construction on the trawlers, as the majority of the boats are away from port for periods of from one to six weeks.

PUBLIC HEALTH IN BOMBAY.

THE population of Bombay at the 1921 census numbered 1,175,914, and at the middle of 1923 was estimated at 1,220,120, on which latter figure the birth and death ratios have been calculated. The birth-rate was 17.20 per 1000; or, if calculated on the census population, the ratio would be 17.85. In that year the birth ratio for the Presidency, as a whole, was 33, and for the city 16. The explanation of this low ratio is stated by Dr. J. E. Sandilands, Executive Health Officer, who presents this report, to be due partly to the custom whereby married women leave the city for their confinement, and so register their children in the mofussil districts where they are born, and partly because some births in the city are not registered. 1487 births were inquired into in 1922 and 1923, and it was found that 63 per cent. only of these infants were born in Bombay, 37 per cent. having been born elsewhere; and, out of 8632 infantile deaths during the year, 31 per cent. occurred in children who had been born outside the city. "Of the infants living and dying in the city it may therefore be assumed that, roughly, one-third were born elsewhere"; if added to the numbers registered, the birth-rate would be increased from 17 to 26 per 1000. The total birth-rate being, however, assumed to be 17.20 per 1000, the variation among different castes ranged from 4.13 per 1000 for Jains and 6.50 for Banias, to 21.01 for Indian Christians, 24.45 for low caste Hindus, 24.82 for Parsees, 28.70 for Anglo-Indians, and 36.71 for Jews. "The impossible rate of 169.59 recorded for

Lingaits is obviously due to an understatement of the Lingait population in the census returns." The registered births numbered 146, and the deaths 339; the Lingait population is stated to be 866. Disregarding this group, the death-rate varied from 8.81 among Banias, and 11.45 among Europeans, to 29.24 for Hindus of all castes, 32.10 for Indian Christians, 34.23 in Jains, 34.89 in Anglo-Indians, and 43.73 in Mussulmans. Jains suffered most heavily from plague (2.75 deaths per 1000), the general plague mortality being only 1.08 per 1000; for Hindus of all castes 1.20, and for Europeans 0.13. "The liability to plague is not improbably due to the fact that Jains do nothing to prevent rats entering and living in their houses." Enteric fever was most fatal to the Parsees (0.64), Bhatias (0.53), and Europeans (0.45), the general enteric mortality being only 0.11 per 1000.

Mortality from All Causes.

In regard to the mortality from all causes in the different wards and sections of the city, the ratios varied from 16.56 per 1000 (Fort South section of Ward A), and 19.05 (Walkeshwar in Ward D), to 36.90 in Worli section (Ward G), and 42.06 in 2nd Nagpada section (Ward E). The infantile mortality varied from 236 per 1000 births in 1st Nagpada section of Ward E, and 264 in Walkeshwar section (Ward D), to 521 in 2nd Nagpada (Ward E), also in Mandvi (Ward B), 534 in Sion section (Ward F), and 548 in Byculla (Ward E). As the registration of births is faulty, the infantile deaths in relation to the total population at all ages are separately stated. This ratio varied from 1.86 per 1000 in Fort South (Ward A) to 9.77 in Byculla section (Ward E), and was 7.07 for the city as a whole. The excessive mortality is largely due to overcrowding; 14,302 births (68 per cent. of the total) took place in families living in a single room or sharing it with others, the infantile mortality being 524.4 per 1000 births. In families occupying two rooms the mortality was 394.5; in three rooms, 255.4; in four or more rooms, 246.5; in hospitals, only 112.2. Much work has been done to remedy this deplorable state of things by visits of nurses, attendance on confinements, provision of necessities, of maternity homes, milk depôts, and infant welfare centres. The municipal nurses paid 54,402 visits, and attended 1914 confinements. Besides this 1773 cases were admitted to the municipal maternity homes; two infant milk depôts have been established, and the Maternity and Child Welfare Scheme of the Infant Welfare Society has made much progress.

Infectious Diseases.

The notifications of infectious diseases numbered 4575, of which total 1501 were for plague, 1274 for tuberculosis, and 978 for small-pox. Plague was epidemic from Feb. 17th to June 2nd, and caused 1329 deaths (1.08 per 1000 population, as compared with 0.67, the quinquennial average). Of these 1202 occurred within the dates mentioned. The case mortality was 89 per cent. No fatal cases occurred in 1st Nagpada section of E Ward, and only one in Upper Colaba. All the other sections suffered more or less, most deaths occurring in Worli (251) and Mahim (172) sections (both in G Ward); and the highest mortality ratios falling on Mahim (3.31), Mahalakshmi (2.02), and Worli (1.98 per 1000). The usual preventive and precautionary measures were continued during the year; infected dwellings were evacuated and disinfected, and temporary health camps established; 13,749 inoculations were performed; 725,574 rats destroyed, of which 305,283 were examined at the Parel laboratory, 2.77 per cent. being found to be infected. The percentage of infection rose from 1.63 in January and 3.55 in February to 6.75 and 7.42 in March and April. It then declined to 2.10 in June and 1.27 in July, and was below 1.0 per cent. for the rest of the year.

Small-pox was prevalent throughout the year, 978 cases being registered, of which 479 were fatal, compared with 130 cases and 61 deaths in 1922. The mortality ratio was 0.39 per 1000, as compared with 0.48, the quinquennial average. No fatal cases occurred in Upper Colaba. In the other sections the mortality was below 1.0 per 1000 in all except 1.04 in Fanaswadi (C Ward) and 1.21 in Chowpati (D Ward). The total primary vaccinations performed numbered 20,293, of which 97.65 per cent. were known to be successful. In addition, 21,725 persons were revaccinated. Of the 87 infants under 1 year of age who died from small-pox, 65 were not vaccinated, and one was vaccinated during the incubation period. In the remaining cases the vaccinal condition was not ascertained, a most regrettable omission.

Cholera was much more prevalent in the city than in the previous year. There were 323 attacks and 189 deaths, as compared with 22 and 15 in 1922; 41 of the cases were imported. No fatal cases occurred in Upper Colaba, Fort South, 2nd Nagpada, 1st Nagpada, or Sion sections. In the remainder, 39 deaths occurred in Market section, and 43 in the adjoining Dhobi Talao, giving death ratios of 1.08 and 1.00 per 1000 respectively. There were two outbreaks. The first (June 6th to 27th) occurred among the Mohammedan pilgrims, coming from distant provinces and

proceeding to Mecca; 16,961 passed through Bombay. They were accommodated as far as possible in three "Mussaferkhanas"; but as these buildings could not hold as many as 2000, many pilgrims had to be lodged in hired buildings with inadequate sanitary arrangements, or were encamped on the open spaces outside the Mussaferkhanas. Two cholera cases occurred in pilgrims arriving from infected provinces. During the month there were 25 attacks and 17 deaths. Sanitary measures were carried out, and 5965 pilgrims were inoculated with anticholera "vaccine"; the spread of the disease was checked. The second outbreak occurred among the city residents. There were 274 attacks and 155 deaths between July 16th and the end of August. The disease had prevailed in Poona, Ahmednagar, and other parts of the province, and "ample opportunities existed for the introduction of infection from the outside." Chlorination of the water-supplies was carried out, and inoculation stations opened, where 1719 persons were treated.

Influenza was registered as causing only 250 deaths (0.20 per 1000), as compared with 1.77 per 1000, the quinquennial average; but respiratory diseases, to which influenza deaths are frequently attributed, caused 14,099 deaths, as compared with 13,614 in the previous year. Tuberculosis caused 1371 deaths (1.12 per 1000), a satisfactory continuation of the improvement during recent years. In the decennium 1913-22, the mortality had averaged 1.95, and in 1922 it was 1.22 per 1000. The work carried on by the King George V. Antituberculosis League was taken over by the municipality in July. There are two dispensaries in the city, and a sanatorium with 32 beds on Bhoiwada Hill, Parel, known as the Turner Sanatorium; 1129 cases were treated at the dispensaries, and the medical officers visited 1258 patients too ill to attend personally.

Malaria was registered as the cause of 403 deaths, the diagnosis being verified in each case. In addition 2692 deaths were returned as due to "Ague and Remittent Fevers"; many of these may have been due to typhoid, tuberculosis, or influenza, in which fever may be a prominent symptom. Spleen examinations (10,553) were carried out among children in all of the 31 sections of the city except four (Kamatipura, Parel, Sewri, and Mahim). No splenic enlargement was found among 126 children in Fanaswadi section of Ward C. The total cases of enlargement numbered 936 out of 10,553 children examined, the ratios varying from 1.2 per cent. in Kumbharwada and 1.4 in Bhuleshwar (both in Ward C), to 10.67 in Tarwadi (Ward E), 10.86 in Fort South (Ward A), 13.7 in Sion (Ward F), 14.88 in Fort North, and 16.82 in Colaba (Ward A). It is regrettable to find that, in the report of the municipal laboratory, out of 1267 milk samples analysed 41.3 per cent. were adulterated. In Ward F the ratio was 62.9, and in Ward G 70.6 per cent.

AN UNUSUAL CAREER.

INFANT prodigies are always interesting in their infancy, but very few of them remain at all noteworthy in their later years. William Robert Grossmith, the son of a Reading picture-frame maker, was something of an exception to this rule. After an astonishing career as a child actor at 6 years old he lived to give his name to the firm of W. R. Grossmith, of Burleigh-street, Strand, which continues to make artificial limbs under its auspices. William Robert Grossmith (1818-99) was the elder brother of George Grossmith, the journalist and entertainer, who founded the branch of the family celebrated as humorists and actors. In many ways William was the more remarkable child. His abilities astounded his family before he could lisp, and when he was 6 years old his father took him to London to see James Jones, the founder of the Coburg Theatre, which has now become the Old Vic. Jones was so struck with his precocity and brilliance that he was allowed to appear at the Coburg in 1824 with songs as a Jew and as a country bumpkin. In a later appearance as Richard III. he got an excellent press. Even the *Times* was moved to remark: "We were much gratified with the performance of the Infant Grossmith, who really exhibits a most wonderful theatrical talent, and which, if well cultivated, will at a future period produce some brilliant acting." He then performed for a week each at the Surrey and Sadler's Wells; but his father declined further engagements, and he returned home. His development could not, however, be stayed, and in a short time he increased his repertory to include violin-playing, recitations, and mimicry, the acting of several Shakespearean characters, and the playing of "musical glasses." A small movable theatre was built for him and he set out on a series of tours of England, starting in his native town, where he entertained 300 people for nearly three hours with dance, drama, and song. His remarkable powers won him the title of The Young Roscius, in contrast to that of The Infant Roscius, conferred on William Betty (1791-1874), who made a fortune and retired at 17. Grossmith became so famous that a short book ("The Life and Theatrical Excursions of William Robert Grossmith, the juvenile actor, not yet nine years of age," 1827, Reading) ran through at least two editions. It is not

known when he left the stage, although it is certain that he did not continue on it in manhood. He was apprenticed to the business of an artificial limb-maker with John Henry Sleath, the inventor of the kneeling artificial knee, who had started business in 1760. Grossmith succeeded to the business in 1843, and in 1857 set forth his story in a pamphlet entitled "Amputations and Artificial Limbs," dedicated to William Lawrence, F.R.S., President of the Royal College of Surgeons. He became a charming old man, and throughout his life retained the sense of humour which had made him a comedian at six years of age.

RIVIERA TRAVEL.

THE Sleeping Car (Wagons-Lits) Company announces the preliminary arrangement for its winter service from Calais direct to the Riviera. The Calais-Mediterranean Express (the Blue Train) will commence running in connexion with the 10.45 A.M. Pullman train from Victoria on Friday, Nov. 6th, and will run via Paris until Feb. 9th, after which date it will run daily direct from Calais to the Riviera without calling in Paris, a separate "Blue Train" being run from Paris daily from Feb. 10th. Six other daily services will run to the Riviera from Calais, and from Paris, with improved sleeping cars. Plans for the return journeys of these services will be kept in London to enable passengers to secure the required accommodation for the homeward journeys before leaving London. Bookings may be made at 20, Cockspur-street, London, S.W. 1.

APPARATUS FOR ACTINO-THERAPY.

WE have reached the season when the sun is below the horizon for half or more of the 24 hours, and the oblique rays, even when there is no cloud, are largely absorbed by water-vapour and atmospheric impurities. Hence all the supplies of artificial light are of enhanced value.

The tungsten arc lamp made by the Medical Supply Association (167-185, Grays Inn-road, London, W.C. 1.) is very well and elaborately constructed, and is useful for ultra-violet radiation when only a low amperage current is available. The electrodes used are either carbon or tungsten. The method of interchanging the electrodes could be simplified. The electrodes are adjusted by a simple, hand-controlled, regulating screw, and a spring release for adjusting the distance between them. This gives a steady burning arc, but the length of the flame and voltage across the arc varies as the carbons burn away. The lamp is made of a highly polished metal; the inner side of the lamp reflector tarnishes rapidly and gets a white deposit of metallic salts, which is difficult to clean. The focusing of the arc is not well centred, and the arrangement of the quartz lens adapter for localised treatment might be improved. The ultra-violet energy is good for near distances up to 18 in., but falls off rapidly beyond 24 in., owing to the diffused scattering of the rays.

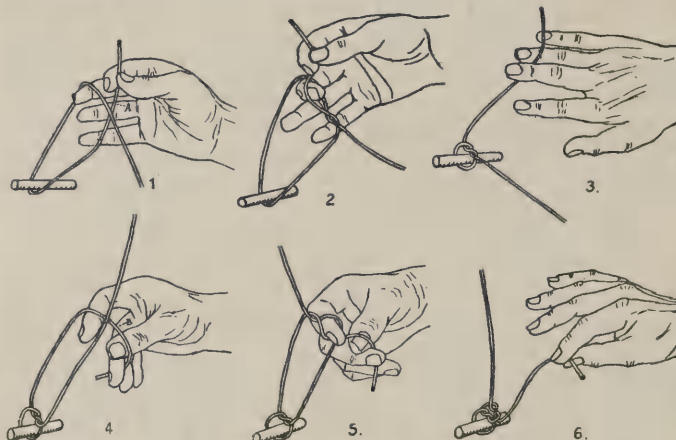
The mercury-vapour lamps manufactured by Messrs. Kelvin, Bottomley and Baird, Ltd. (51-52, Fenchurch-street, London, E.C. 3) are of the atmospheric type. When the current is switched on, the arc is started by means of a small heating coil which surrounds a limb of mercury projecting from the arc tube. The mercury is heated up in this limb by means of the heating coil; when the mercury boils the arc is established, and the heating coil is automatically cut out of the circuit. Lamps of many descriptions and different shapes are made for local and general light treatment. They are very steady in burning and require no attention when started. The ultra-violet energy is very high, and is very constant. The quartz is made by the Thermal Syndicate, and is of a good quality. The lamp is economical and easy to run, and shows very little deterioration with prolonged use. Up to the present such lamps can only be made for direct current, but it is anticipated shortly to supply alternating current burners. The K.B.B. lamps are exceptionally useful for all work when a steady and constant service of ultra-violet energy is required.

The Hilger spectrometer is a useful apparatus for detecting ultra-violet rays in artificial sources of light. The spectro-scope is a small type, and the rays after passing through the system of prisms is focused on to a uranium glass. The apparatus is still in an experimental stage, and many small alterations are necessary before it will be possible easily to adopt its use.

The interesting catalogue of the Cox-Cavendish Electrical Co., Ltd. (105, Great Portland-street, London, W. 1), collects together the most useful types of lamps now available for artificial sun treatment. It is of great guidance to the practitioner, and each type of apparatus is clearly described and well illustrated. Every endeavour is made to indicate the advantages and best way of utilising these lamps. The catalogue includes all the standard types of lamps, and should be of great assistance in helping to provide for "light" clinics. The literature is well produced, and much useful reference to current literature is adopted. The description of the flaming open carbon arc is clearly expressed and the biological standards are quoted. It is a complete and briefly classified catalogue on photo-therapy.

A "SINGLE-HANDED" SQUARE KNOT.

Dr. F. G. Meynen, in a current issue of the *Journal of the American Medical Association* (August 22nd, p. 579), describes a simple and easy method of tying a square knot which, once the knack is acquired, possesses the following advantages: It is rapid and cannot fail to tie "square"; only one hand (the right) is directly used; at no time is it necessary to drop either end of the suture—each movement leading naturally with the succeeding one without rearranging the grasp. It is adaptable to all purposes and positions. Dr. Meynen describes the procedure thus: "It is essential to remember that the long end (if there is a choice) should always be grasped by the left hand. In the drawings, for



Steps in tying the knot.

the sake of simplicity, the long end is left free without indicating the left hand. Assuming that the long end comes out of the wound on the far side from the surgeon about to tie the knot (as is the case, for example, when the first knot in a continuous suture is tied by an assistant for the operator), it is grasped by the left hand, while the short end is grasped about 1 inch from the end between the thumb and index finger of the right hand with the palm down. The palm is immediately turned upward with the suture lying across the fingers and the longer end brought into the position shown in Fig. 1. The middle finger is then hooked under the portion of the suture marked A, as in Fig. 2; this is drawn through the loop by grasping it between the middle and ring fingers, and first single knot drawn tight as in Fig. 3. The same firm grasp being kept with the middle and ring fingers, the palm is turned somewhat upward, the thumb and first finger being placed under the suture and the long end in the position shown in Fig. 4. The tip of the index finger is then hooked under the portion marked B, as in Fig. 5, drawing it through the loop and grasping it between the thumb and index finger as soon as it is through, and the knot is drawn tight and completed as in Fig. 6. Should a third knot be desired, the hand will be found in a position ready to repeat the first manœuvre from Figs. 1 to 3. Should the surgeon be desirous of tying his own suture (in which case the short end will come out on the far side of the wound and the long end on the near), he has only to begin with the manœuvres depicted in Figs. 3 to 6 and end with Figs. 1 to 3.

"This method is particularly suitable and rapid for ligating vessels with a long ligature wound around the fingers of the left hand. It must be remembered, however, to begin with Fig. 1, when the long end comes up on the far side of the clamp, and with Figs. 3 to 6 and then Figs. 1 to 3 when the long end comes up on the near side of the clamp. This decision will come instinctively with practice. The knot can be tied easily in two seconds."

"DORMA" EAR PADS.

THESE pads are designed to relieve sufferers from head noises. They are to be placed in front and behind the ear—there are both single and double pads—where they are retained in position by elastic bands. A point is made of the free circulation of air between the meatus and the pillow on which the patient is resting, and it is claimed that throbbing noises due to heart action, which are sometimes very distressing, are much or wholly suppressed. Under the advice of a medical man the apparatus should prove useful, and our readers might have cases in which they could be employed. The apparatus in the single form costs 15s., and in the double form 25s., from the Dorma Manufacturing Co., 25 and 27, Quadrant Chambers, New-street, Birmingham.

THE UNMARRIED MOTHER.

THE National Council for the Unmarried Mother and her Child, which has issued its seventh annual report, has to contend against public apathy, and against those whose anxiety for public morality makes them pretend that unmarried parents do not exist. There are also those who think illegitimate children poor specimens best out of the world; those who would fight for the child's welfare, but care nothing for the mother, and those who wish to "rescue" the mother but would allow the child to be adopted. The Council is strongly against separation of the mother and child, from the point of view of both. The death-rate of illegitimate children in their first year (132 per 1000 births in 1923 in England and Wales) is twice that of children born in wedlock, and the Council attributes this partly to artificial feeding or early weaning encouraged by the idea that the child can be adopted. Besides activity on behalf of actual cases—628 during last year—the Council is attempting to get the existing Bastardy and Affiliation Acts reformed. The Legitimacy Act, now almost law, and Captain Bowyer's Bastardy Bill represent some of its aims, which include the hearing of affiliation cases before the child's birth, payment by the father towards pregnancy and confinement expenses, and improvement of the legal position of adopted children. The offices are at Carnegie House, 117, Piccadilly, London, W. 1.

A USEFUL CATALOGUE.

WE have received from Messrs. May and Baker, Ltd., Battersea, London, an interesting catalogue of their pharmaceutical specialties. The catalogue gives information concerning a number of pharmaceutical products supplied by the manufacturers which have been noted in our columns at different times. The indications for the employment and the technique for the administration of such well-known drugs as arsenobillon, novarsenobillon, and stovarsol are clearly set out, the last two preparations of the firm having been tested biologically by the Medical Research Council and approved by the Ministry of Health. The firm supplies also vaccines for the treatment of gonorrhœa which have been prepared by the pathological laboratory of the London Lock Hospital, as well as some well-known preparations of bismuth.

THE PRIVATE COUNSELLOR.¹

IN writing this work the author's desire has been to provide the layman with a book dealing with the more common diseases and derangements of the male generative organs. That there is a deplorable amount of ignorance on the subject of sex with much resulting harm we are convinced. At the same time it is probable that this work by an anonymous medical writer will in the end leave his readers in a worse state than that in which it found them. The pages contain vivid descriptions of the ravages of untreated syphilis and of the deplorable condition of individuals who persist in self-abuse. Thus, in the chapter on syphilis we hear that this disease "breaks down the vigorous and lusty youth, covering the body with loathsome ulcers or destroying the bones, and thus defacing the manly beauty of the human face divine." We fear that the work is calculated to precipitate a breakdown in the person whom it is intended to help. A morality built on fear is a poor thing, and fear is the mainspring of this work. Even if the author does not intend to frighten he will do so. No layman can read a medical work without the risk of believing himself to be the victim of some of the disorders described within its covers, and many a sexual neurosis has resulted from an unwise excursion into medical literature. Whilst believing that the author's intentions are excellent, we deplore the result of his efforts.

Col. J. S. Riddell, A.M.S. (T.), C.B.E., M.V.O., has been appointed a Deputy-Lieutenant for Aberdeen.

T. L. A., with whose views we have considerable sympathy, has omitted to enclose his address.

T. D.—There seems no room for hypnotic phenomena in the interesting case related, although hypnotists have been known to use light chloroform anaesthesia to aid the induction of a hypnotic state. The case is probably one of a delusional system related to paranoia, inasmuch as intellect is unimpaired and there are no neurotic symptoms. Time will show.

¹ The Private Counsellor. By a Medical Practitioner. London: Educational Press. 1925. With 24 plates. Pp. 197. 6s. 6d.

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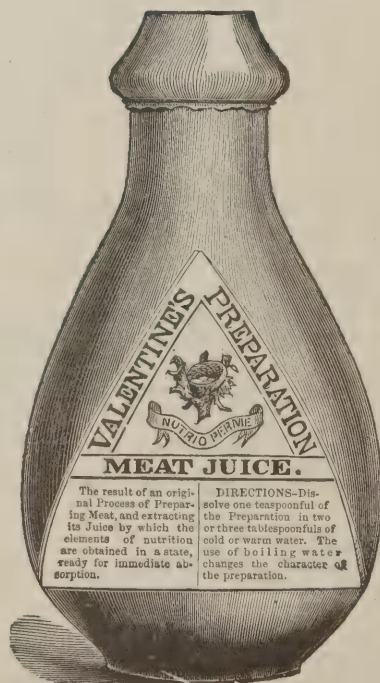
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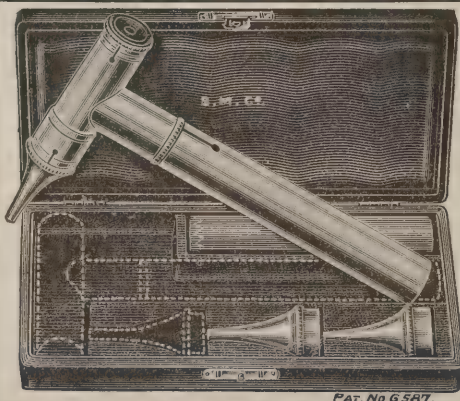
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"The Medical Press," Oct. 15, 1924—

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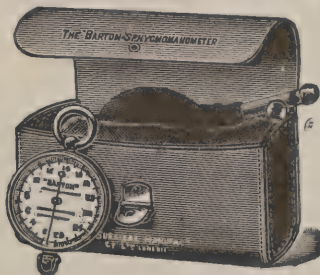
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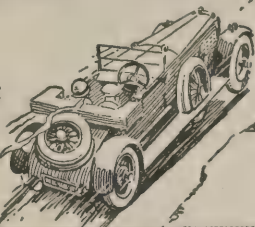
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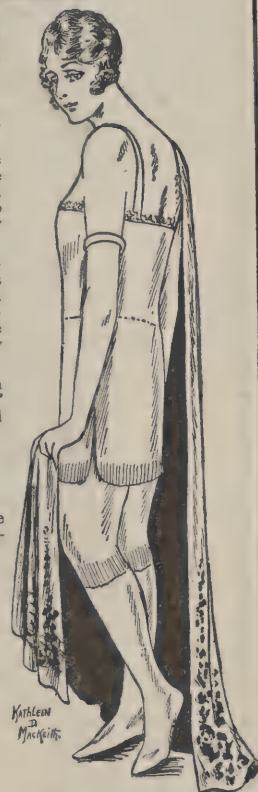
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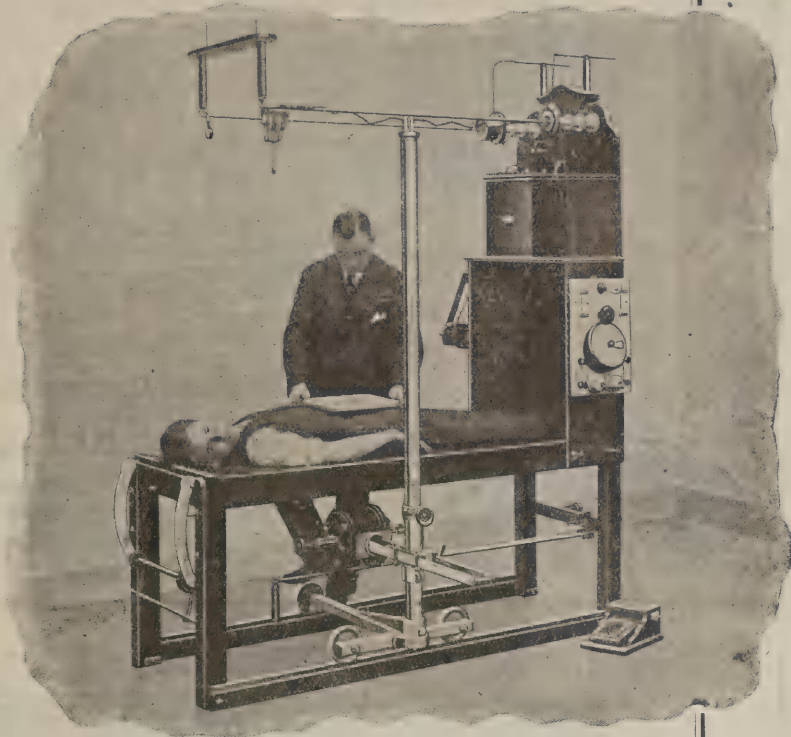
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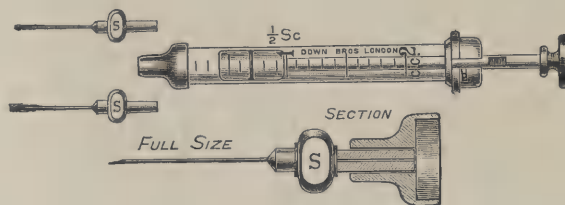
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*Vide Brit. Med. Jour.,
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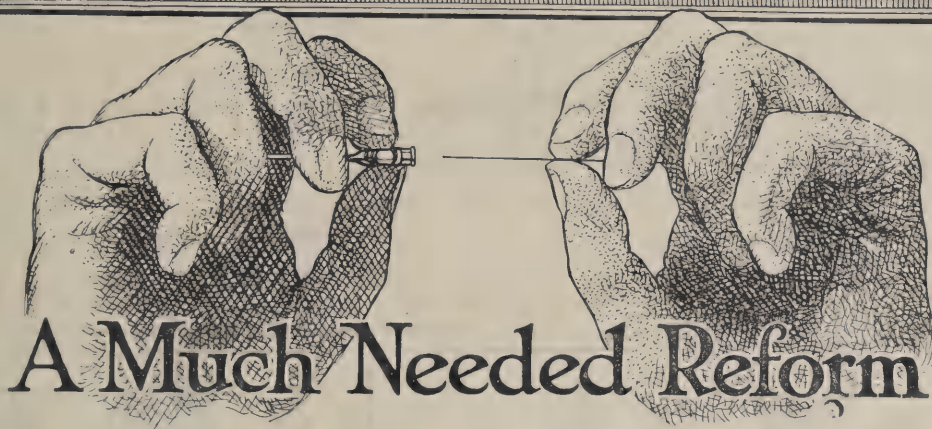
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The demand has been far in
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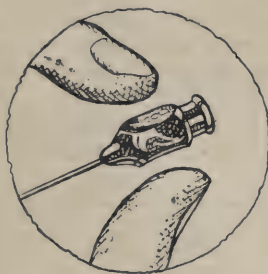
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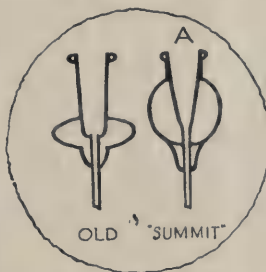
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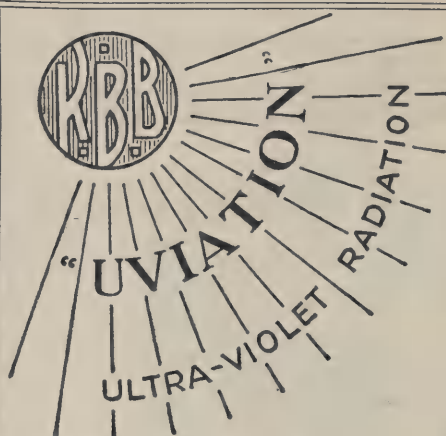
How advantageous this is to doctors whose sight is not of the best—or whose hands are unsteady after a very exacting or particularly long spell of work—can be easily imagined.



Note the concave surface of cone, giving a firmer and easier grip.



This diagram shows why the Summit Needle can be "threaded" from the cone end. Note the converging bore, (A).



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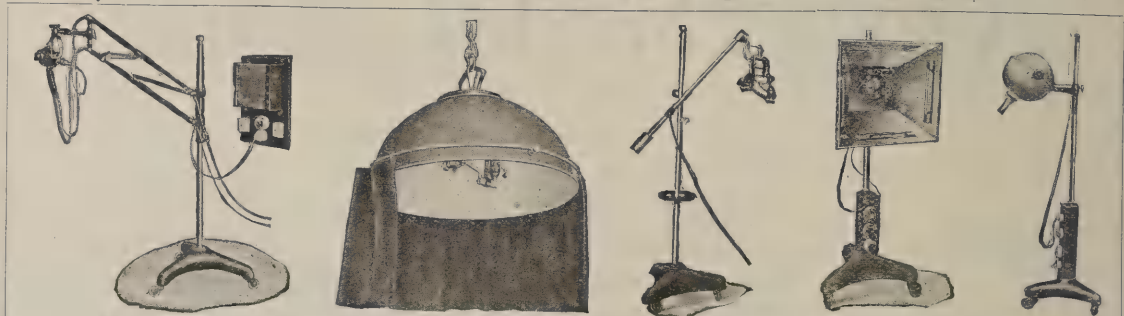
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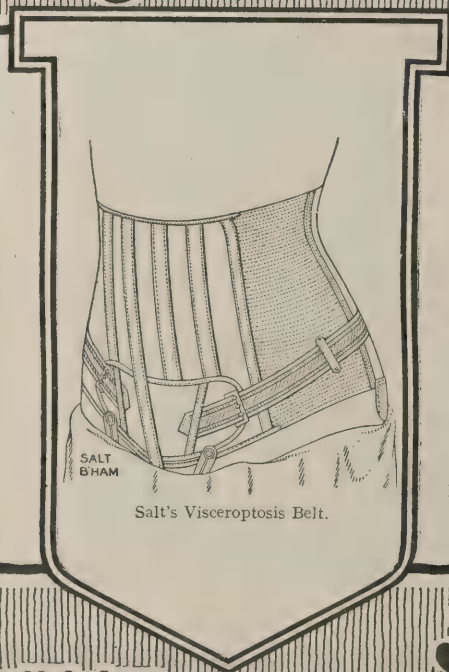


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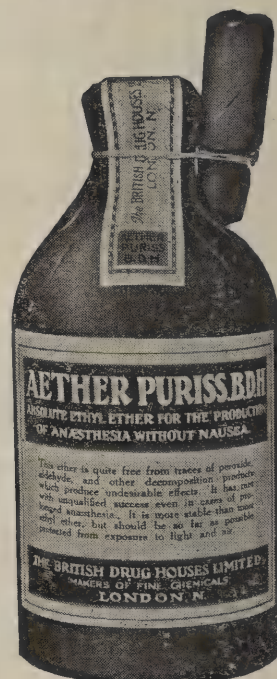
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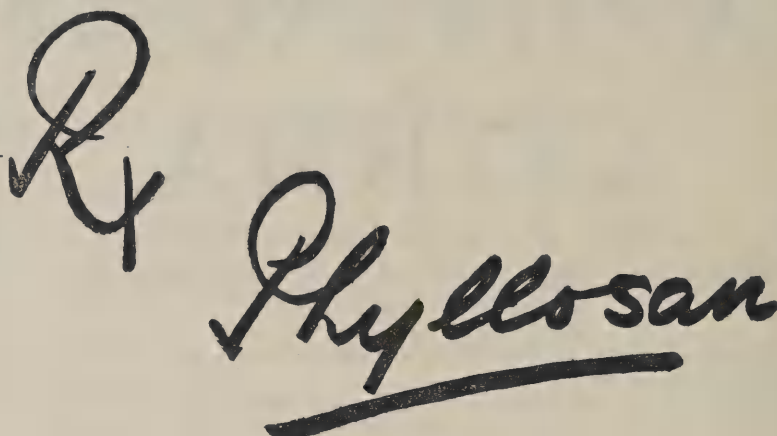


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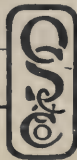
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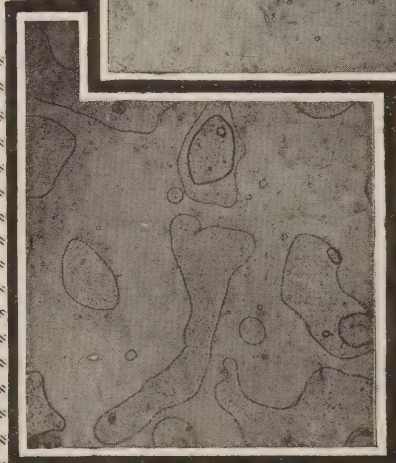
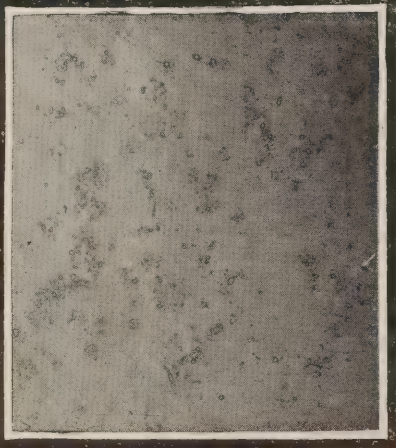
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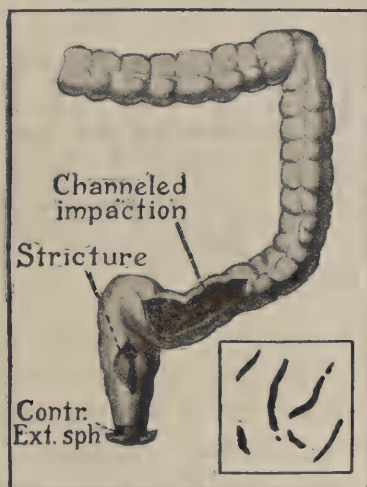
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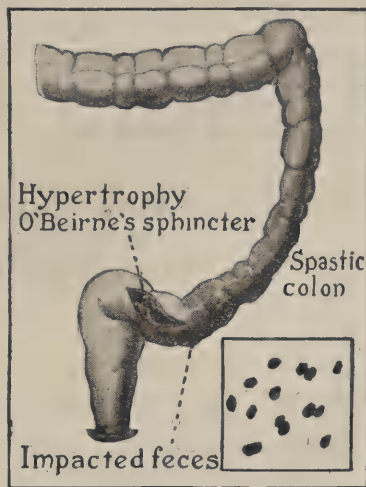
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M 171



Penciled Stool — In spastic bowel, stenosis, channeled fecal impaction and contracted external sphincter.



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The Feces as an Aid in Diagnosis

EXAMINATION of feces is a valuable aid in diagnosis, says a prominent gastro-enterologist.

Size is no criterion of normality. Since over 90% of the dried stool is bacteria, a copious evacuation may even be a sign of colonic disease, *i.e.*, typhoid.

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Mucus indicates intestinal inflammation.

Acidity. The normal stool is slightly acid. Rectal stasis because of resulting alkalinity produces autolysis of fecal flora resulting in small, hard, dry stools.

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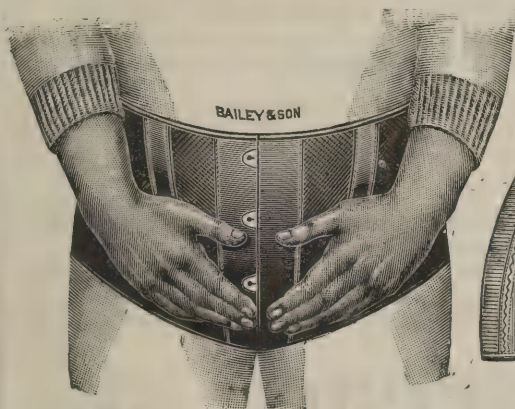
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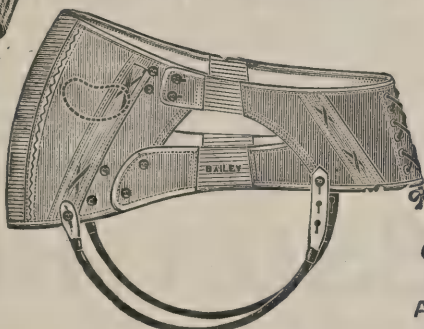
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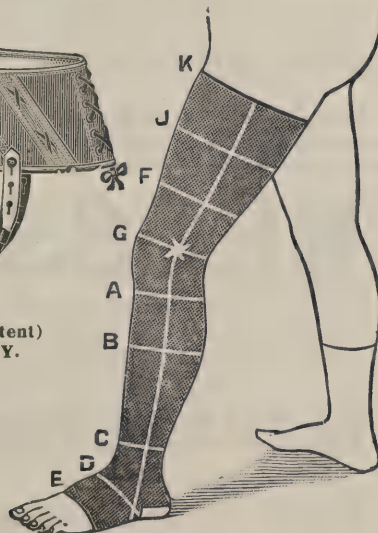
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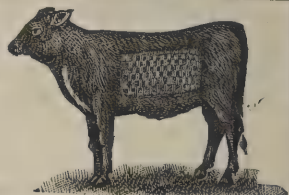
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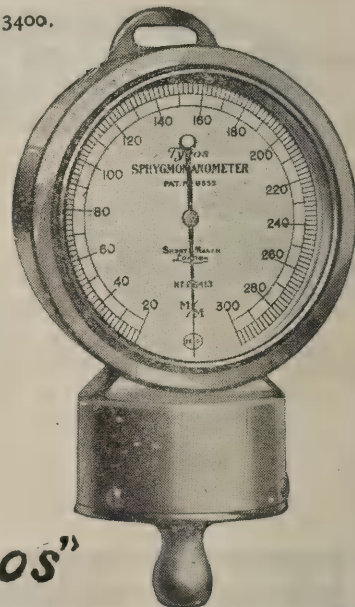
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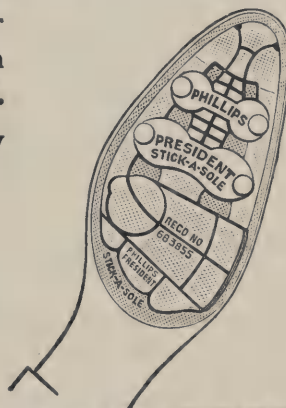
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OPENING OF WINTER SESSION, OCTOBER 1ST, 1925.

Introductory Address at 2.30 P.M. by Sir ARTHUR KEITH, M.D., LL.D., D.Sc., F.R.C.S., F.R.S., Hunterian Professor of the Royal College of Surgeons of England. The Rt. Hon. The Viscount Hambleden will preside.

The Past and Present Students' Dinner will be held the same evening at 7 for 7.30 at the Connaught Rooms, Great Queen-street, W.C. 2, Sir Lenthal Cheate, K.C.B., C.V.O., F.R.C.S., in the Chair. The Secretaries to the Dinner Committee are Dr. Ernest Playfair and Dr. H. A. Richards.

The Calendar of the School, including that of the School of Dental Surgery, giving information as to Prizes, Entrance and other Scholarships, &c., may be obtained on application to the Dean, H. WILLOUGHBY LYLE, M.D., B.S. Lond., F.R.C.S., or to S. C. RANNER, M.A. Cantab., the Secretary of the Medical School.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2 (University of London.)

The WINTER SESSION will begin on THURSDAY, OCT. 1st, 1925.

The Medical School provides Courses in Preliminary, Intermediate, and Final Subjects, and Students can join at once after matriculation.

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University of London.

A Course of Ten Lectures on "THE HISTOLOGY OF NERVE TISSUES AND PATHS OF CONDUCTION IN THE CENTRAL NERVOUS SYSTEM" will be given by Dr. C. DA FANO (Reader in Histology in the University), at KING'S COLLEGE, LONDON (Strand, W.C. 2), on THURSDAYS, OCT. 8th, 15th, 22nd, and 29th; NOV. 5th, 12th, 19th, and 26th; and DEC. 3rd and 10th, 1925, at 5 P.M. Syllabus obtainable on application to the undersigned.

A Course of Eight Lectures on "THE PHYSIOLOGY OF HEARING AND VISION" will be given by Mr. R. J. LYTCHGOE at UNIVERSITY COLLEGE, LONDON (Gower-street, W.C. 1), on MONDAYS and WEDNESDAYS, OCT. 12th, 14th, 19th, 21st, 26th, and 28th; and NOV. 2nd and 4th, 1925, at 5 P.M.

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Liverpool School of Tropical Medicine.

UNIVERSITY OF LIVERPOOL.

Courses of Instruction (lasting about three months) for the DIPLOMA IN TROPICAL MEDICINE commence on October 1st and January 7th, and for the DIPLOMA IN TROPICAL HYGIENE on January 7th and April 24th. (Candidates for the D.T.H. must possess the D.T.M.)

For particulars apply to the Hon. Dean, School of Tropical Medicine, Pembroke-place, Liverpool.

Royal College of Physicians of London.

The next PROFESSIONAL EXAMINATION for the MEMBERSHIP will commence on TUESDAY, OCTOBER 20th.

Candidates are required to give fourteen days' notice in writing to the Registrar of the College, with whom all certificates and testimonials required by the bye-laws are to be left at the same time.

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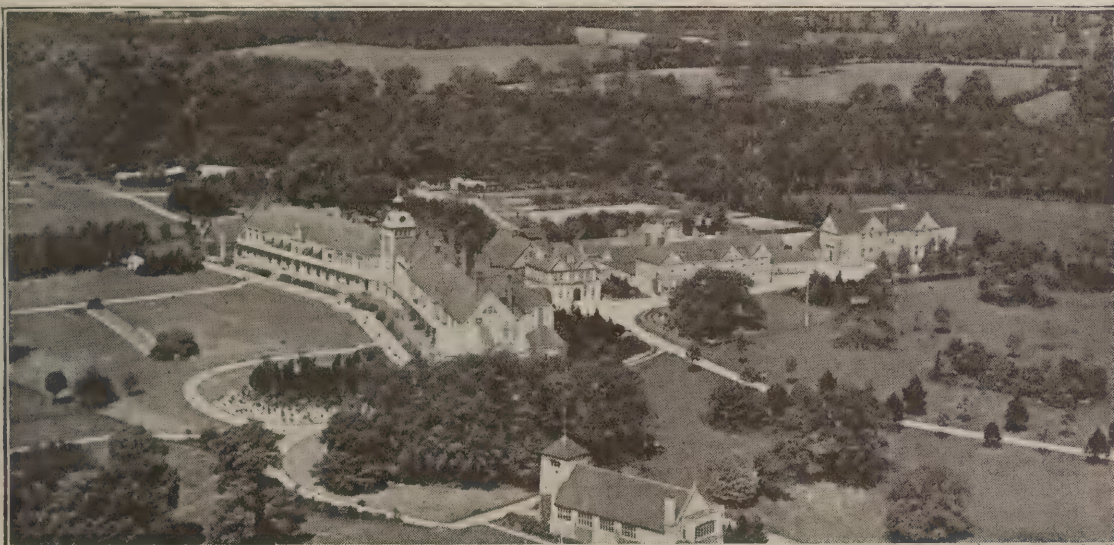
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THE COTSWOLD SANATORIUM.

A private sanatorium specially built in 1898 on the Cotswold Hills, seven miles from Cheltenham, for the treatment of Pulmonary and all other forms of Tuberculosis on Nordrach lines. Aspect S.S.W., sheltered from North and East, elevation 800 ft. Pure bracing air. SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-ray controlled), TUBERCULINS, VACCINES, and ULTRA-VIOLET RAYS (Mercury Vapour Arc Lamp) is available without extra charge. X-RAY plant. Electric light. Radiators with hot and cold basins in all rooms. Full day and night Nursing Staff.

Resident Physicians: ARTHUR H. HOFFMAN, M.D., and GEOFFREY A. HOFFMAN, M.B.

Apply: Secretary, Cotswold Sanatorium, Cranham, Gloucester.

Telephone: 22 Painswick.

Telegrams: Hoffman, Birdlip.

The work hitherto carried on at
DUFF HOUSE, BANFF, SCOTLAND,
has been transferred to
RUTHIN CASTLE,
NORTH WALES,

which is now opened as a Private Hospital for sufferers from any non-infectious INTERNAL DISEASES who need investigation or treatment.

Special arrangements are made for carrying out the preliminary tests needed for the proper administration of INSULIN in diabetes.

Application should be made to the Secretary.

MENDIP HILLS SANATORIUM



Specially built, facing south. 300 acres of Sanatorium grounds—meadow and woodland; sheltered pine avenues. Altitude 850 ft. Magnificent view for miles south; hot-water radiators and electric light in each room and chalet.

All forms of treatment, including X-ray, Vaccines, and Pneumothorax in suitable cases. Trained Nurses. Individual attention.

For particulars, apply SECRETARY, Hillgrove, Wells, Somerset. Telegrams: Hillgrove, Wells, Somerset.

Resident Physicians { Dr. C. MUTHU.
Dr. T. C. BRENTNALL.

ST. KATHARINE'S, HOOK HEATH, WOKING.

FOR THE TREATMENT OF CASES OF TUBERCULOSIS.

Pleasantly situated on the "Upper Bagshot Sands," 200 feet above sea level, it stands in its own charming grounds facing South and West, and sheltered from the North and East, in a mild and bracing climate.

Trained Nurses on duty night and day. Facilities for Artificial Pneumothorax and other modern methods.

Electric Light, Gas and Water laid on, Main Drainage.

For particulars apply to A. R. SNOWDON, M.R.C.S., L.R.C.P., Medical Superintendent, St. Katharine's, Hook Heath, Woking, Surrey.



KINGUSSIE, N.B. THE GRAMPIAN SANATORIUM.

Situated in the Upper Speyside district of Inverness-shire. One of the highest inhabited districts in Britain—"The Switzerland of the British Isles." Bracing and dry mountain climate, well sheltered. Sanatorium specially built for the Open-Air Treatment of Tuberculosis. Open in 1901. Elevation nearly 900 ft. above sea-level. Electric light throughout buildings and in rest shelters. FULLY EQUIPPED X-RAY PLANT. All forms of Treatment available, including facilities for Treatment by artificial Pneumothorax. A few rooms are now reserved for surgical cases not requiring immediate operation. Terms: 4 to 6 guineas weekly.—For Particulars apply: FELIX SAVY, M.B., Ch.B., Physician-Supt.

PRIOR PLACE SANATORIUM

HEATHERSIDE, CAMBERLEY.

RECENTLY OPENED FOR THE TREATMENT OF PULMONARY TUBERCULOSIS
WELL SITUATED ON HIGH GROUND AND SURROUNDED BY PINES AND HEATHER.

RESIDENT MEDICAL SUPERINTENDENT: DR. H. O. BLANFORD, late Medical Superintendent, King Edward VII. Sanatorium, Midhurst, to whom applications for particulars may be made.



FARMWOOD SANATORIUM

— ASCOT —

This Sanatorium provides for the treatment of patients suffering from Pulmonary and other forms of Tuberculosis.

The Medical Staff consists of a Consulting Physician and two Visiting Physicians.

Terms from 7 guineas a week. There are no extras.

One hour from London by road or rail.

For full particulars apply to the Secretary, Farmwood, Ascot.

INEBRIETY.

[Telephone: 16 Rickmansworth.]

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars apply to F. S. D. Hogg, M.R.C.S., &c., Resident Medical Superintendent.

BAY MOUNT, PAIGNTON ALCOHOLISM, DRUG HABIT, NEURASTHENIA.

Ladies and Gentlemen received.

Small, select home, standing in 3½ acres of secluded gardens overlooking Torbay, near Torquay. Billiards, golf, tennis, &c. Every case treated with a view to rapid and permanent cure.

All communications must be addressed to SECRETARY, or STANFORD PARK, M.B., Bay Mount, Paignton.

Tel.: Paignton 210.

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M. (Edin.).

Prospectus and full information on application to the Managing Director.

PALACE SANATORIUM, MONTANA-SUR-SIERRE, SWITZERLAND.

TUBERCULOSIS CURE STATION

(All the Year). THE FINEST IN EUROPE.

5000 ft. high. Accommodation for 100 patients.

Resident Medical Officers:

ANDREW MORLAND, M.B., B.S. (Lond.),
Formerly House Physician, Brompton Hospital.

ERIC ZIMMERLI, M.D. (Bâle), M.R.C.S. (Eng.).

FULL PARTICULARS FROM THE SECRETARY, 5, ENDSLEIGH
GARDENS, LONDON, N.W.1.

DUCHY HOUSE, HARROGATE.

Facilities are provided by Team Work for the Systematic Investigation and Treatment of Diseases, the nature and origin of which are obscure.

Special attention is given to the accurate control of diet and the training of the patient in detail essential to the treatment of Diabetes Mellitus (and the use of Insulin), Obesity and other Disorders of Nutrition.

[Further information may be obtained from the MATRON,

Telegraphic Address:
"Relief, Old Catton."

Telephone:
"290 Norwich."

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—

A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.

For full particulars apply to the Misses MCINTOCK, or to Dr. S. BARTON, 34 Surrey-st., Norwich, Visiting Physician.

LASSODIE HOUSE,

Telephone 553.

DUNFERMLINE, SCOTLAND.

PRIVATE HOME for Nervous and Mental Cases, beautifully situated in extensive and secluded grounds. Terms from Matron, or from Dr. WILLIAM MUIR, Medical Superintendent.

PORTSMOUTH BOROUGH MENTAL HOSPITAL.

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds, with sea views. Charges from 3 guineas weekly, including all necessities, except clothing. Apply to the Medical Superintendent.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms Moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM, WEST MALLING. Telephone: No. 2 MALLING.

BARNWOOD HOUSE

HOSPITAL FOR MENTAL DISEASES,
BARNWOOD, near GLOUCESTER

Telephone: No. 7 Barnwood.

Exclusively for PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES.

This institution is devoted to the Care and Treatment of persons of both sexes at moderate rates of payment.

Voluntary boarders not under certificates are admitted.

Under special circumstances the rates of payment may be reduced by the Committee.

The MANOR HOUSE for Ladies only, which is entirely separate from the Hospital and standing in its own grounds, is utilised exclusively for voluntary patients.

For further information apply to ARTHUR TOWNSEND, M.D., the Medical Superintendent.

ASHWOOD HOUSE

KINGSWINFORD, STAFFORDSHIRE.

An old-established home-like Institution for the treatment of MENTAL AFFECTIONS in BOTH SEXES.

Full particulars as to reception terms, &c., may be obtained from the Resident Medical Officer.

LITTLETON HALL, BRENTWOOD, ESSEX



(18 MILES FROM LONDON.)

400 feet above sea.

HOME for few LADIES Mentally Afflicted. Large grounds. Liverpool st. 26 min. Stations: Brentwood, Shenfield, one mile. Boarders received. Apply Dr. Haynes. Telephone and Telegrams: Haynes Brentwood 45.

CALDECOTE HALL,

Nr. Nuneaton.

A Sanatorium for the Residential Treatment of Curable cases of Alcoholism, Drug Addiction, and Functional Nervous Disorders (in Men) upon the most scientific modern lines, both physical and mental.

Beautifully appointed country mansion situated in the centre of England and surrounded by an extensive park.

Every form of recreation and occupational treatment is available in addition to specially skilled medical treatment.

Terms, according to bedroom accommodation, from 3 to 12 guineas weekly.

For prospectus and particulars apply to the Sec., 40, Marsham-street, S.W. 1, or to the Residential Medical Director. Consultations can be arranged by appointment with Dr. Alfred Carver at 59, Newhall-street, Birmingham.

Grove House, All Stretton, Church

STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Bucks Mental Hospital,

Stone, near Aylesbury.

The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly charge of 1½ guineas. No vacancies for female cases at present.

Apply to the Medical Superintendent.

Hampstead.—Patient or Guest

requiring care, rest-cure, supervision, received in Doctor's house under his personal supervision. Excellent cuisine and comfort.—Address, No. 991, THE LANCET Office, 423, Strand, W.C. 2.

Dukeries.—Doctor offers comfortable

HOME to Resident Patient. Nice house and garden. Healthy district. Excellent cooking and service. Last patient remained 15 years.—Address, No. 167, THE LANCET Office, 423, Strand, London, W.C. 2.

Chelsea Hospital for Women, Arthur-

street, Chelsea, S.W. 3.—A vacancy has occurred for the post of SURGEON to the Hospital. Candidates must be Fellows of the Royal College of Surgeons of England, Edinburgh, or Ireland. They must be registered under the Medical Act and engaged in Consulting Practice only.

The Senior Surgeon to Out-patients is a candidate for the post. If he be elected there will be a vacancy for a SURGEON to OUT-PATIENTS. Candidates for this appointment must be qualified as above. Applications must be sent, accompanied by three testimonials, to the undersigned on or before Friday, 2nd October next.

HERBERT H. JENNINGS, Secretary.

The Hospital for Sick Children,

Great Ormond-street, London, W.C. 1.

A HOUSE SURGEON is required on 12th October, 1925.

A HOUSE PHYSICIAN and ASSISTANT CASUALTY OFFICER is required on 14th October, 1925.

Gentlemen are invited to send in their applications, addressed to the Secretary, before 12 o'clock, on Monday, 5th October, 1925, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible hospital appointment.

The appointments are made for six months. Salary £50 laundry allowance £5, board and residence in the Hospital. Candidates must be unmarried, and possess a legal qualification to practise.

All candidates must be in attendance to appear before the Joint Committee, if required, at their meeting on Wednesday, 7th October, 1925, at 5 P.M. precisely.

Forms of application and copies of the rules may be obtained from the Secretary.

By order of the Board of Management.

September, 1925.

JAMES MCKAY, Secretary.

The Throat Hospital, Golden-square,

W. 1.—Two fully qualified and registered HOUSE SURGEONS are shortly required. Salary at the rate of £100 per annum, with board, residence and laundry. The appointments will be made for six months, but may be extended at the discretion of the Committee of Management.

Applications, with copies of three testimonials, to be sent to the undersigned by the 7th October.

WM. HOLT, Secretary-Superintendent.

The Throat Hospital, Golden-square,

W. 1.—Applications are invited for the appointment of HONORARY SURGICAL REGISTRAR, for which there are two vacancies.

The applications, with copies of three testimonials, should be sent to the undersigned not later than the 30th September.

WM. HOLT, Secretary-Superintendent.

Paddington Green Children's Hospital,

London, W. 2.—HOUSE PHYSICIAN, HOUSE SURGEON. These appointments will become vacant on November 1st, 1925. Gentlemen are invited to send in their applications, with copies of three testimonials, addressed to the undersigned, not later than October 16th, 1925. Salary of each £150 per annum, with board and residence. Candidates who have held a responsible Resident Hospital appointment are preferred. The appointments are for a period of six months.

JAMES A. HAMLIN, Secretary.

The Hospital for Epilepsy and

PARALYSIS, Maida Vale, W. 9.

A RESIDENT MEDICAL OFFICER required 1st November. HOUSE PHYSICIAN required 1st November.

Applications are invited for these posts. The salaries are at the rate of £150 and £100 per annum respectively, and the appointments are for six months. Candidates for the post of Resident Medical Officer should state if they are willing to take that of House Physician, and applications, accompanied by copies of three recent testimonials, should reach me by 3rd October.

The accommodation at the Hospital does not permit of Women Graduates holding these appointments.

Signed,

H. W. BURLEIGH,
Secretary and General Superintendent.

County of London.

The London County Council invites applications for appointment as EIGHTH ASSISTANT MEDICAL OFFICER (Men) in the Mental Hospitals under its control. Candidates must be not more than 35 years of age, and must be registered to practice both in Medicine and Surgery in England. Candidates appointed will be pensionable under the Asylums' Officers Superannuation Act, 1909. Preference will be given to those who served or offered to serve with H.M. Forces. Salary £300 a year, rising by annual increments of £25 to £400 a year, without emoluments, also (at present) temporary additions to salary making the total commencing remuneration about £432 a year. Charges made for board, lodging, &c. (at present £2 9s. weekly), to such officers as are resident. Full particulars and conditions of appointment on form of application (on which alone application can be made) obtainable from the Chief Officer, Mental Hospitals Department, County Hall, Westminster Bridge, S.E. 1. Canvassing disqualifies. Applications must be received by Monday, 12th October, 1925.

MONTAGU H. COX, Clerk of the London County Council.

West Ham Union.**SPECIALIST CONSULTANT IN LIGHT TREATMENT.**

The Guardians invite applications from qualified Medical Practitioners for the post of Specialist in Light Treatment at the WHIPPS CROSS HOSPITAL, Whipps Cross-road, Leytonstone, E. 11. Applicants must be of definite consultant rank and must be attached in that capacity to some Special Hospital or to a corresponding Special Department of a General Hospital.

The appointment will be for a period of one year in the first instance.

The gentleman appointed will be required to visit twice weekly the Whipps Cross Hospital, to be responsible for the work carried out in the Light Department and to examine and treat (or advise as to treatment in) such cases as are referred to him by the Medical Superintendent. It is anticipated that each visit would be of some hours' duration according to the necessities of the work. In the first instance the Consultant will be required to advise as to the accommodation, plant, &c., to be provided in the Department.

The remuneration will be £300 per annum, to be paid as from the date of the opening of the Department, and the Consultant will be expected to provide his own locum tenens during holidays or absences.

Applications and testimonials to be forwarded to me at this office not later than 10 A.M. on Monday, the 28th September, 1925.

Further particulars, if desired, can be obtained by letter or interview from Dr. J. C. Muir, the Medical Superintendent of the Hospital.

By order of the Board.

THOMAS SMITH, Clerk.

Board Room, Union-road, Leytonstone, E. 11,
3rd September, 1925.

The Mildmay Mission Hospital,

Austin-street, Bethnal Green, London, E. 2 (near Shoreditch Church).—Applications are invited for the post of ASSISTANT CASUALTY OFFICER (Female) which becomes vacant on November 2nd, 1925. The appointment is part-time and non-resident, and for six months. Salary £100 per annum.

Candidates must be duly registered under the Medical Acts, and the Mildmay Council are anxious that they should be fully in sympathy with the religious work of the Hospital.

Applications, with copies of recent testimonials, should be sent to the Medical Superintendent at once.

REGISTRARS.**Royal National Orthopaedic Hospital.**

The Committee invite applications for three vacancies in the office of REGISTRAR. Honorarium one hundred guineas. Appointment for 12 months, renewable for a further 12 months on the recommendation of the Medical Board. Candidates must be doubly qualified. Duties to commence on November 1st. Applications, with copies of three recent testimonials, should reach the Secretary, 234, Great Portland-street, W. 1, not later than October 17th. Particulars of duties will be forwarded on application. Ladies will not be appointed unless in the absence of suitable male candidates.

King's College Hospital.

Applications are invited before 5th October, 1925, for the following appointments:—

CLINICAL ASSISTANTS in the Medical, Surgical, Gynaecological, Children's, Neurological, Cardiological, Aural, Laryngological, Ophthalmic, Skin, Urological, Orthopaedic, Pathological, Radiological, and Dental Departments.

MEDICAL and SURGICAL OUT-PATIENT OFFICERS. SAMBROOKE MEDICAL, SURGICAL, and OBSTETRIC REGISTRARS.

Particulars of the above may be obtained from the House Governor, King's College Hospital, Denmark Hill, S.E. 5.

Metropolitan Borough of St. Pancras.**ASSISTANT MEDICAL OFFICER (MALE).**

Applications are invited from registered Medical Practitioners for the appointment of an Assistant Medical Officer (Male) in the Public Health Department.

The appointment is a whole-time one, and the officer appointed will be required to carry out, under the supervision of the Medical Officer of Health, such duties under the Council's Maternity and Child Welfare Scheme and the Council's Tuberculosis Scheme, as may be required from time to time by the Council. Applicants must have had adequate experience in these duties.

The appointment is subject to the approval of the Ministry of Health and the London County Council, to the by-laws and regulations of the Borough Council, and to termination by one month's notice on either side.

The salary will be £600 per annum, rising by annual increments of £25 to £650. No bonus will be paid.

Applications, endorsed "Assistant Medical Officer," stating age, qualifications, and previous experience, and accompanied by copies of three recent testimonials, should be forwarded to the undersigned not later than 12 noon, Wednesday, 7th October, 1925.

Canvassing, either directly or indirectly, any member or officer of the Council, will disqualify.

By order.

Town Hall, Pancras-road, N.W. 1. F. CREED, Town Clerk.

Hackney Hospital,

230, High-street, Homerton, E. 9.

The Board of Guardians invite applications from duly qualified ladies and gentlemen for the position of JUNIOR ASSISTANT MEDICAL OFFICER.

Candidates must be single and have held a Resident Hospital or Infirmary appointment.

The Hospital contains 800 beds and equipped with modern requirements.

Besides the Medical Superintendent, there are four Resident Assistants and a Clinical Pathologist.

The remuneration is at the rate of £350 per annum, rising £25 per annum to a maximum of £425 per annum, together with rations, washing, furnished apartments, and attendance.

The officer appointed will be required to render assistance at the other establishments and departments within the Union, to assist in the training and instruction of Nurses, and to devote his or her whole time to the service of the Guardians.

The appointment will be subject to the provisions of the Poor-law Officers' Superannuation Act, 1896.

Further particulars as to the duties may be obtained from the Medical Superintendent.

Canvassing the Guardians, directly or indirectly, will disqualify a candidate.

Applications, stating age, qualifications, and experience, and accompanied by copies of not more than three recent testimonials, should reach me not later than the 2nd October, 1925.

FRANK R. COLES, Clerk to the Guardians.

Clerk's Offices, Hackney Union, 2, Sidney-road,
Homerton, E. 9.

Royal Northern Hospital, Holloway,

London, N.—Applications are invited for the appointment of PHYSICIAN to the Hospital, with charge of Out-patients.

Candidates must possess the degree of M.D. or M.B. obtained by examination at a British University, and be Fellows or members of the Royal College of Physicians of London.

Full particulars of the appointment, and with regard to the submission of testimonials may be obtained from the undersigned, to whom applications should be sent on or before 21st October.

GILBERT G. PANTER, Secretary.

Eastern Dispensary, Leman-street,

E. 1.—Applications are invited for the appointment of a PHYSICIAN to attend on Tuesday and Thursday evenings at 5.30 P.M. Candidates must be either Graduates in Medicine of a British University or Members of a Royal College of Physicians in the United Kingdom. Honorarium at rate of £65 per annum. Applications, stating age, together with copies of not more than three recent testimonials, to be sent in on or before the 30th September to the undersigned.

21st September, 1925.

GEORGE W. ILSLEY, Secretary.

Royal Chest Hospital, City Road, E.C.

(Royal Northern Group of Hospitals.)

The post of HOUSE PHYSICIAN at this Hospital will be vacant on 1st November. The appointment is for six months. Salary at the rate of £100 per annum, with board, residence, and laundry.

Applications, with copies of testimonials, should be sent on or before the 12th October to the undersigned, from whom forms of application and rules can be obtained.

GILBERT G. PANTER, Secretary.

Royal Chest Hospital, City Road, E.C.

(Royal Northern Group of Hospitals.)

The post of RESIDENT MEDICAL OFFICER at this Hospital will be vacant on the 1st November. The appointment is for six months, when re-election is required.

Salary at the rate of £150 per annum, with board, residence, and laundry.

Applications, with copies of testimonials, should be sent on or before the 12th October to the undersigned, from whom forms of application, rules, and further particulars can be obtained.

GILBERT G. PANTER, Secretary.

Belgrave Hospital for Children

(INCORPORATED), 1, Clapham-road, S.W. 9.

The Committee of Management invite applications for the post of ASSISTANT SURGEON. Candidates must be Masters of Surgery of an English University or Fellows of the Royal College of Surgeons of England.

There is an honorarium of fifty guineas per annum attached to the post.

Applications, with copies of testimonials, must be delivered to the undersigned by 10 A.M. on Thursday, 8th October, from whom further information may be obtained.

By order.

THOMAS CLAPHAM, Secretary.

Belgrave Hospital for Children

(INCORPORATED), 1, Clapham-road, S.W. 9.

The Committee of Management invite applications for the posts of HOUSE SURGEON and ASSISTANT HOUSE PHYSICIAN, which will become vacant on 31st October.

Applicants (Men) must be fully qualified and registered.

The appointments are for six months, with board, residence, and washing provided. Salary at the rate of £100 per annum.

Applications, with copies of testimonials, to be delivered to the undersigned by 10 A.M. on Thursday, 8th October, from whom further particulars may be obtained.

By order.

THOMAS CLAPHAM, Secretary.

The Miller General Hospital for South

EAST LONDON, Greenwich-road, S.E. 10.

Present accommodation 100 beds. Extension in course of erection for 78 beds.

PATHOLOGIST required who shall give such time daily as may be necessary to carry out the work of the Pathological Department at the Hospital. The candidate elected will be allowed to do private work in the Hospital's laboratory, but he will not be allowed to accept any other appointment without the consent of the Board of Management. Salary £500 per annum. The appointment is an annual one. Duties to commence on January 1st next. Candidates will be expected to call upon the members of the Honorary Medical and Surgical Staff. Applications, giving qualifications, with copies of not less than three recent testimonials, to be sent to the Secretary of the Hospital on or before November 1st next.

21st September, 1925.

Willesden Urban District Council.**APPOINTMENT OF MEDICAL OFFICERS.**

Two whole-time Medical Officers holding registrable qualifications in Public Health are required for the Health Department of the Willesden Urban District Council.

The salary scale will be £600 per annum, rising, after three years' satisfactory service, by increments of £30 per annum to £750 per annum. No bonus will be paid.

The appointments are subject to the Local Government and Other Officers' Superannuation Act, 1922, and no candidate over 40 years of age will be appointed.

Applicants should have had experience in Ante-natal and Maternity work, Diseases of Children, Refraction work, and Infectious Diseases.

Application forms with full particulars of the appointments may be obtained from the Medical Officer of Health, Health Department, Town Hall, Dyne-road, Kilburn, N.W. 6, and must be returned to him not later than 9 A.M. on Friday, the 9th October, 1925.

Envelopes bearing communications relative to these appointments must have "Medical Officer" written on them on the top left hand corner.

E. A. PRATT, Clerk of the Council.

Town Hall, Dyne-road, Kilburn, N.W. 6,

September, 1925.

York City Mental Hospital, Fulford,

York.—Male ASSISTANT MEDICAL OFFICER (Deputy Medical Superintendent) required. Age must not exceed thirty-five. Previous Mental experience essential. Salary £440, together with the emoluments of furnished house, washing, attendance, and garden produce, valued at £85 per annum. The appointment is subject to the provisions of the Asylum Officers' Superannuation Act, 1909.

Applications, stating age, qualifications, experience, and nationality, accompanied by copies of not more than three recent testimonials, to be sent before October 7th to the Medical Superintendent.

The General Hospital, Birmingham.

In consequence of the appointment of Mr. H. H. Sampson to the office of Honorary Surgeon, the Board invites applications for the vacant post of ASSISTANT SURGEON.

Candidates must be Fellows of one of the Royal Colleges of Surgeons of the United Kingdom.

The appointment is subject to renewal every three years. An honorarium of £50 per annum is paid.

Applications, accompanied by diplomas, certificates of registration and testimonials, must be received by September 29th. Candidates will be expected to attend the meeting of the Board on October 2nd at 12 noon.

September 4th, 1925.

A. H. LEANEY, House Governor.

Manchester Royal Infirmary.

Central Branch, Roby-street, Manchester.

54 Beds for Surgical Patients. New Casualties about 30 daily.

RESIDENT MEDICAL OFFICER (Lady), £200 per annum,

with board, residence, and allowance for washing.

ASSISTANT MEDICAL OFFICER (Lady), £100 per annum,

with board, residence, and allowance for washing.

The Board of Management of the Manchester Royal Infirmary invite applications for the above appointments.

The appointments are tenable for six months commencing forthwith.

Applicants must state age and send twelve copies of their application and testimonials to the undersigned by Friday, 9th October, 1925.

Applicants for the Senior appointment are requested to state whether, if unsuccessful, they apply for the Junior appointment also.

FRANK G. HAZELL, Gen. Supt. and Secretary.

26th September, 1925.

County Borough of South Shields.**VENEREAL DISEASES MEDICAL OFFICER.**

Applications are invited from fully qualified and registered Medical Practitioners for the post of Clinical Venereal Diseases Medical Officer at a salary of £750 per annum.

The appointment is subject to confirmation of the Ministry of Health.

Applicants must have held a House appointment in a General Hospital. Special experience in the diagnosis and treatment of Venereal Diseases is essential. Experience in Bacteriological work will be considered an additional qualification.

The gentleman appointed must devote the whole of his time to the duties of the post, and not engage in private practice. He will be under the administrative control of the Medical Officer of Health, from whom forms of application may be obtained.

Applications, with copies of three recent testimonials, should be received at my office not later than noon on Wednesday, the 30th Sept., 1925, marked "Appointment of Medical Officer."

J. MOORE HAYTON, Town Clerk.

Town Hall, South Shields, September, 1925.

Ingham Infirmary, South Shields.—

Wanted, JUNIOR HOUSE SURGEON (Male). Salary £150, with residence, board, and washing. No out-visiting. Candidates must hold registered qualifications in Medicine and Surgery. The appointment will be terminable by one month's notice. Applications, stating age and accompanied by copies (which will not be returned) of recent testimonials, to be sent to the undersigned, from whom further particulars may be obtained.

JOHN POTTER, Secretary.

Ancoats Hospital.—Assistant Surgical

REGISTRAR required (Lady or Gentleman) to attend Hospital three half-days per week. Candidates must be fully qualified and have held a previous hospital appointment. Salary £40 per annum. Applications, stating age, qualifications, and experience, with copies of three recent testimonials, to be forwarded to the undersigned on or before Sept. 29th next.

By order.

HERBERT J. DAFFORNE, Secretary.

Torbay Hospital, Torquay.—Resident

MEDICAL OFFICER wanted for October 14th. Salary £200 per annum, with board, residence, and laundry. Candidates must be fully qualified, registered, and unmarried.

Applications, stating age, nationality, and qualifications, with copies of not more than three recent testimonials, to be sent to the undersigned.

E. L. GRIST, Secretary.

September 16th, 1925.

Essex County Hospital, Colchester.—

The Hospital Committee invite applications for the post of RADIOLOGIST and MEDICAL OFFICER in charge of the Electro-therapeutic Department to the above Institution. The successful candidate for the above post, which is entirely an honorary one, shall give an undertaking to confine his practice strictly to his speciality and not to engage in general practice nor in consulting Medical or Surgical work. Applications, together with copies of testimonials, must be received by October 21st, 1925.

ALFRED G. BUCK, Secretary.

City of Norwich.—Wanted, Temporary

ASSISTANT SCHOOL MEDICAL OFFICER in the Public Health Department for nine to ten weeks. The duties will be those connected with the Medical Inspection of School Children. Salary £11 11s. per week.

Special qualifications desirable and other things equal, preference will be given to candidates who have held appointments in Children's or General Hospitals.

Applications, stating age, qualifications, experience, and when at liberty, to reach Dr. PATTIN, S.M.O., Churchman House, Norwich, on or before October 1st.

Manchester Babies' Hospital, Burnage—

lane, Levenshulme.

Applications are invited for the post of RESIDENT MEDICAL OFFICER. The appointment is for six months. Salary at the rate of £125 per annum, with laundry. Only candidates with previous Hospital experience need apply. Appointment to date from October 30th.

Applications are also invited for the post of non-resident CLINICAL ASSISTANT. Appointment is for six months, commencing October 14th. Salary at the rate of £50 per annum.

Applications for both appointments, together with testimonials, should be sent to the undersigned, marked "R.M.O." and "Clinical Assistant" respectively, by October 5th.

ANGELA LOPEZ, Secretary.

Norfolk County Council.**APPOINTMENT OF ASSISTANT TUBERCULOSIS OFFICER.**

Applications for the above post are invited.

Special experience in the diagnosis and treatment of Tuberculosis is essential. The Officer appointed will work under the direction and supervision of the County Tuberculosis Officer, and will be required to reside in King's Lynn.

The duties consist of visiting patients at their homes, dispensary, and such other work as may from time to time be required. Travelling expenses are provided and the Officer is supplied with a car. Experience in driving is essential. Should the Officer appointed drive his own car, mileage rates will be paid according to the Council's scale. The appointment will be subject to three months' notice on either side.

Salary £600 per annum, subject to 5 per cent. deduction under the Local Government and Other Officers' Superannuation Act, 1922, which has been adopted by the Council.

Applications, accompanied by not more than three recent testimonials, stating age, experience, and date when free to commence duties, must be received by Dr. W. B. Christopherson, County Tuberculosis Officer, Bank Court, The Walk, Norwich, not later than Thursday, October 1st, 1925.

H. C. DAVIES, Clerk of the Council.

Shirehouse, Norwich, 11th Sept., 1925.

62

Bath Royal United Hospital.—

Wanted, a HOUSE PHYSICIAN (Male, unmarried). Appointment for six months (at least). Salary £125 per annum. Applications, stating age and qualifications, to be sent to the Secretary by Oct. 3rd, 1925.

By order of the Board.

J. M. SHEPPARD, F.C.I.S., Secretary.

Salford Royal Hospital. (260 Beds.)

Applications are invited for the office of MEDICAL REGISTRAR. Candidates must be registered Medical Practitioners. The appointment is for a period of one year. Salary £250 per annum.

Applications, accompanied by copies of recent testimonials, stating age, qualifications, and experience, must be forwarded to the undersigned without delay.

By order of the Board.

GEO. RUDDLE, General Superintendent and Secretary.

Salford Royal Hospital, Manchester, September 21st, 1925.

Salford Royal Hospital. (260 Beds.)

Wanted, a fully qualified RADIOLOGIST for duties each morning (Sunday excepted) and at such other times as may be required. Salary £300 per annum. The appointment is for a period of twelve months.

Candidates must be registered under the Medical Acts. Duties to be carried out under the supervision of the Honorary Radiologists. Applications, stating age and qualifications together with copies of testimonials and certificate of registration, to be addressed without delay to the undersigned, from whom all particulars may be obtained.

By order of the Board.

GEORGE RUDDLE, General Superintendent and Secretary.

Salford Royal Hospital, Manchester, September 21st, 1925.

University of Lucknow.**NOTICE.**

Applications are invited for the post of PROFESSOR OF SURGERY. Salary Rs. 1200-50-1400 p.m., with benefits of Provident Fund after confirmation. Period of probation one year. Rate of contribution to Provident Fund: 8 per cent. by the Officer and 8 per cent. by the University. Private practice allowed. Applications, stating age, qualifications, references, together with copies of testimonials, should reach the Registrar on or before the 31st October, 1925.

Countess of Dufferin's Fund.**WOMEN'S MEDICAL SERVICE FOR INDIA.**

Medical Woman required as RADIOLOGIST to the LADY HARDINGE MEDICAL COLLEGE AND HOSPITAL, Delhi, India. Emoluments Rs. 750 p.m., rising; furnished quarters, provident fund, travelling allowance.

Applications on prescribed form (sent on written request), with copies of three recent testimonials, should reach the Hon. Secretary, U. K. Branch, Dufferin Fund, c/o Major-General J. B. Smith, India Office, Whitehall, S.W. 1, not later than October 16th, 1925.

Sept. 18th, 1925.

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M.B., F.R.C.S.(Edin.). — Wanted. PRACTICE or PARTNERSHIP in South of England, or near London, with scope for Surgery. Three years' Hospital experience, &c. Capital available.—Address, No. 142, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, London or near Suburb, £1500 upwards, Practice with panel at least 2000. House on lease or might buy.—Apply, No. 1523, c/o Percival Turner, 4/5 Adam-street, Adelphi, W.C. 2.

Wanted, Practice about £1000 to £1500 per annum. Home Counties or South of Thames. Partnership would be considered. Surgery an attraction. House with at least 4 bedrooms; rent preferred, or might buy. Capital available.—Apply, No. 1072, c/o Percival Turner, 4/5, Adam-street, Adelphi, W.C. 2.

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Third Share in good Private and Panel Practice, north London, remainder later. Single man preferred.—Dr. Smith, 131, Grosvenor-road, Highbury. Apply, Sunday, Monday, Thursday evenings after 8 P.M.

Essex Suburb.—Old-established PRACTICE, nice district. Receipts about £1100 per annum. Small panel. Good house (6 bedrooms). Lease. Premium £1600.—Apply, Peacock & Hadley, 19, Craven-street, Strand, W.C. 2.

South Staffordshire Town near Birmingham.—Long-established MEDICAL PRACTICE for sale. Average receipts (exclusive of appointments) £2700. Panel over 1500. Also public appointments. Excellent doctor's house. Good introduction. Premium 1½ years' purchase. Selling through illness.—Apply, Doctor, Philip Harris & Co., Ltd., Edmund-street, Birmingham.

Near Kensington.—Old-established PRACTICE. Receipts last twelve months £1700. Panel about 1700. Excellent residence in quiet thoroughfare; rent moderate. Long lease.—Apply, Peacock & Hadley, 19, Craven-street, Strand, W.C. 2.

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Consulting Room, Harley Street. Ground floor, best position, furnished or unfurnished, with use of large handsomely furnished waiting-room, attendance, light, and heat. £280 per annum.—Address, No. 163, THE LANCET Office, 423, Strand, W.C. 2.

Consulting Rooms to Let in Doctor's house, close to Marble Arch; attendance included.—Address, No. 172, THE LANCET Office, 423, Strand, W.C. 2.

Consulting Room to Let in well-furnished house in Harley-street. Bedroom or small Service Suite also if desired.—Address, No. 171, THE LANCET Office, 423, Strand, W.C. 2.

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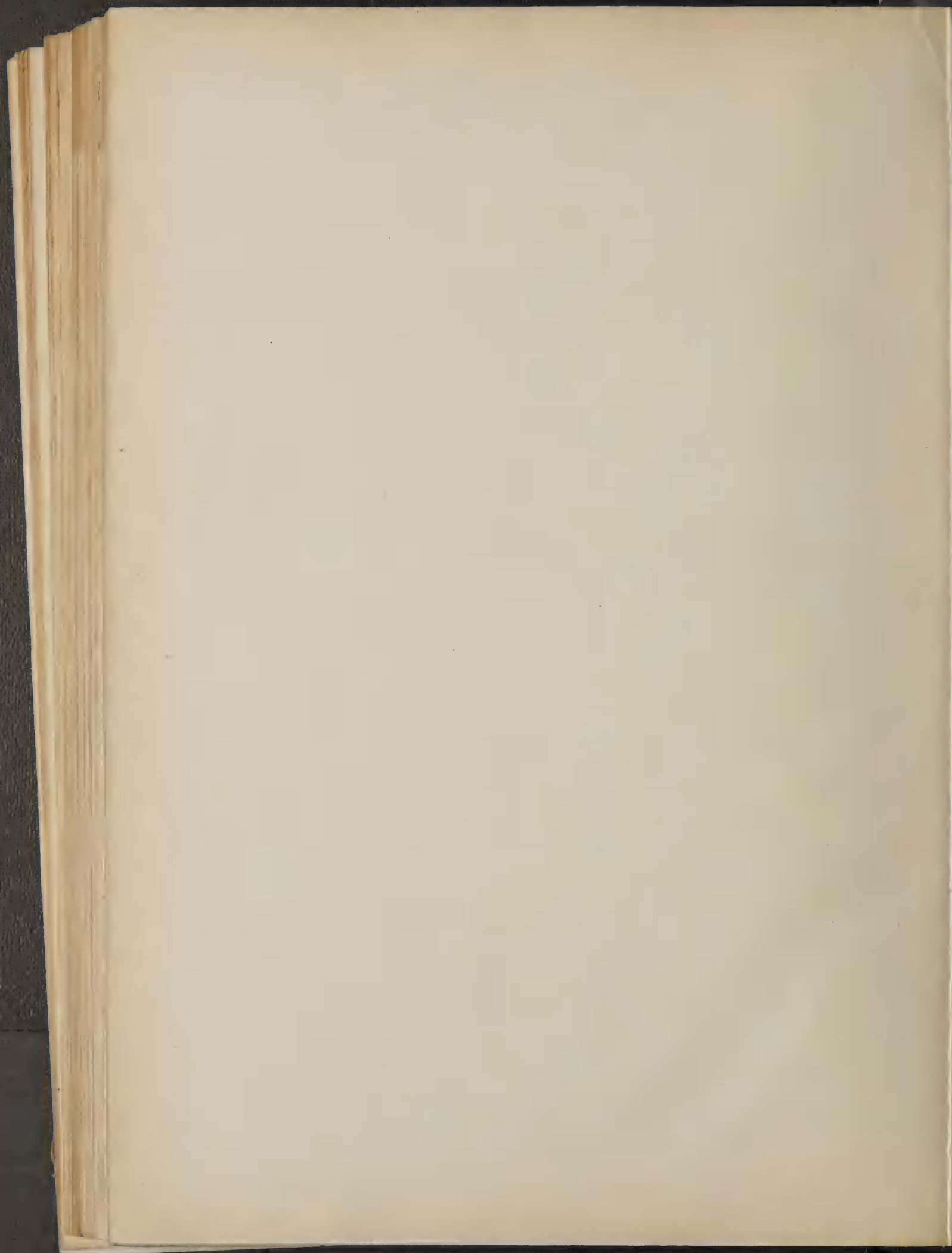
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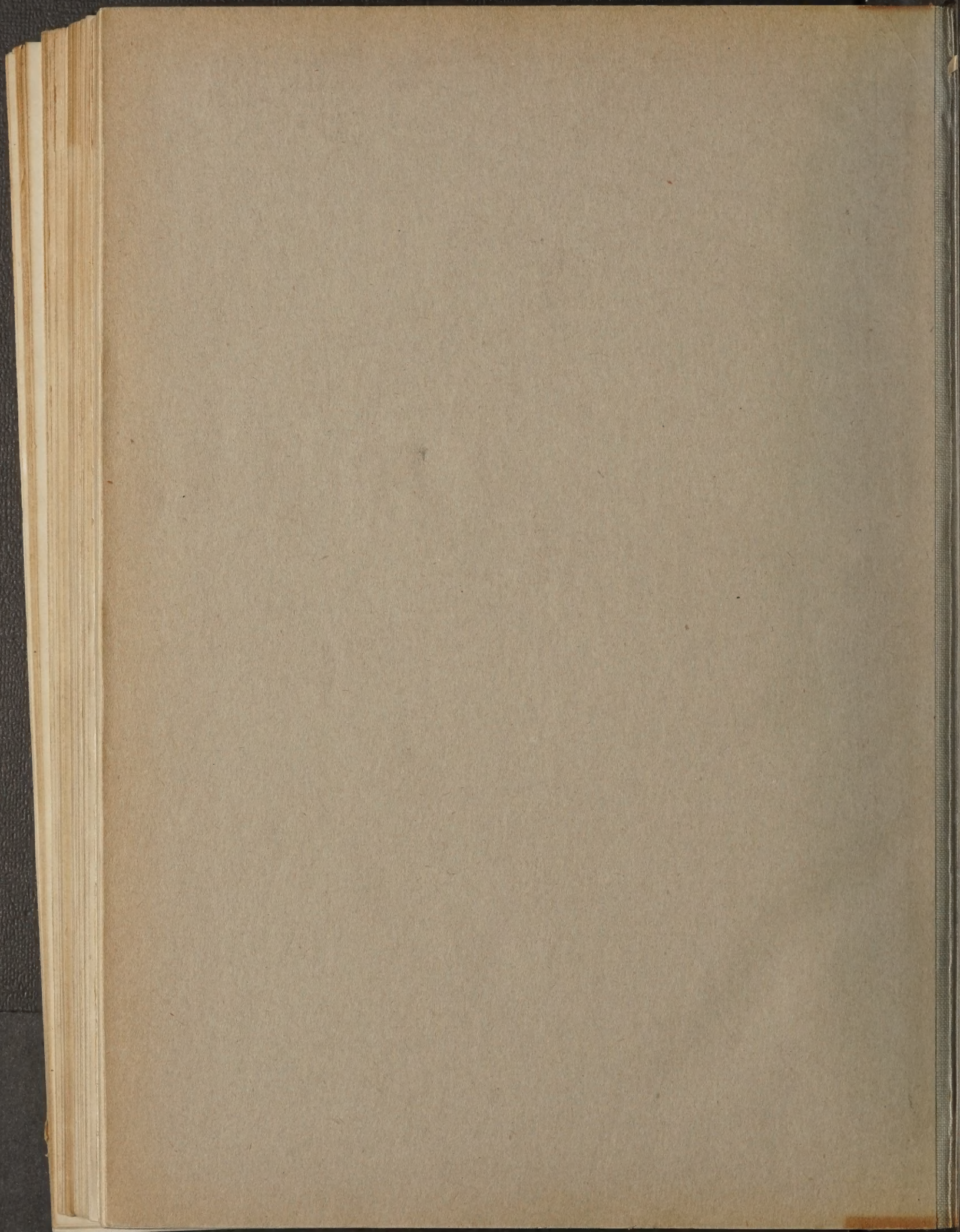


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